# DUXBURY UPS

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DUXBURY UPS

# POWER LINE DISTURBANCES

**Dip (Sag):** is a short term decrease in line voltage.
Usually it results from a short circuit in the power line or a sudden increase in electrical load on the line (start up of large loads), utility switching or equipment failure.

**Surge:** is the exact opposite of a dip. It is a temporary increase in line voltage that lasts at least one cycle (approx. 16mS).
It can be triggered off by rapid reduction in power loads or by utility switching.

**Spike (transient):** is similar to a surge except that it lasts less than a full cycle (often only a few milliseconds).
It can be 100% or more above nominal voltage.

**Electrical Noise:** probably the most common type of disturbance, which is a random high voltage, or high frequency interference on the power line caused mostly by non-linear loads. There are two types of noise, usually referred to as common mode (noise between power connection and ground) and transverse mode (noise between power connections).

**Brownout:** is a deliberate reduction in AC line voltage by the utility company during periods of unusual high demand or insufficient load capacity. The power line supply does not have the full capacity to supply the load which results in load sharing.

**Blackout:** this is the ultimate power disturbance. It is a complete cut in the power line supply (power failure). Typically described as “zero-volt” condition lasting longer than half a cycle.
Can be caused by utility equipment failure, lightning etc . . . the list is long.

Businesses are becoming more and more reliant on a utility power supply that is pushed beyond its capacity. Despite advances in the capabilities of modern personal computers, a momentary power outage is still all it takes to lose your data.

More dangerous is the loss of previously written files, or even an entire hard disk, which can occur should a power problem strike while your computer is saving a file. Network file-servers constantly writing to disk are particularly susceptible.

Some African countries, including South Africa, have resorted to power rationing as a way to meet increasing demand.
In these cases, the question of whether or not to use power conditioning, is no longer a choice.

## HOW POWER PROBLEMS CAN BE AVOIDED

Below is a table of power problems and how to solve them.

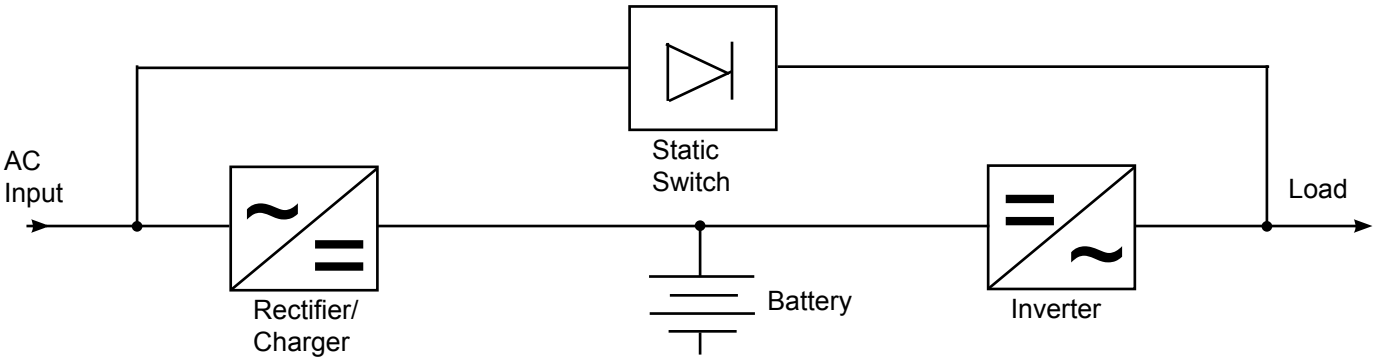
| Equipment Available | Automatic Voltage Regulator (AVR) | Line Conditioner | Offline UPS | Line Interactive UPS | True Online UPS | Frequency Converter |
|---|---|---|---|---|---|---|
| Surges | Limited Protection (MOV) | Full Protection | None or Limited Protection (MOV) | Limited Protection | Good Protection | Good Protection |
| Spikes | Limited Protection | Full Protection | None or Limited Protection (MOV) | Limited Protection | Good Protection | Good Protection |
| Sags | Good Protection | Full Protection | None or Limited Protection | Limited Protection | Full Protection | Full Protection |
| Noise | Limited Protection | Good Protection | None or Limited Protection | Limited Protection | Good Protection | Full Protection |
| Blackout (Power Failure) | No Protection | No Protection | Good Protection 4ms-8ms Changeover | Good Protection | Full Protection (no break) | No Protection |
| Frequency Variation | No Protection | Good Protection | No Protection | Limited Protection | Full Protection | Full Protection |
| Waveform Distortion | No Protection | Good Protection | No Protection | Limited Protection | Full Protection | Full Protection |

## CABLE SELECTION CHART

| Cable Size | Armoured Cable Free Air Wired | Unarmoured Cable Free Air Wired |
|---|---|---|
| 2.5mm2 | 27 Amps | 24 Amps |
| 4.0mm2 | 35 Amps | 32 Amps |
| 6.0mm2 | 43 Amps | 41 Amps |
| 10mm2 | 60 Amps | 55 Amps |
| 16mm2 | 70 Amps | 72 Amps |
| 25mm2 | 100 Amps | 94 Amps |
| 35mm2 | 125 Amps | 115 Amps |

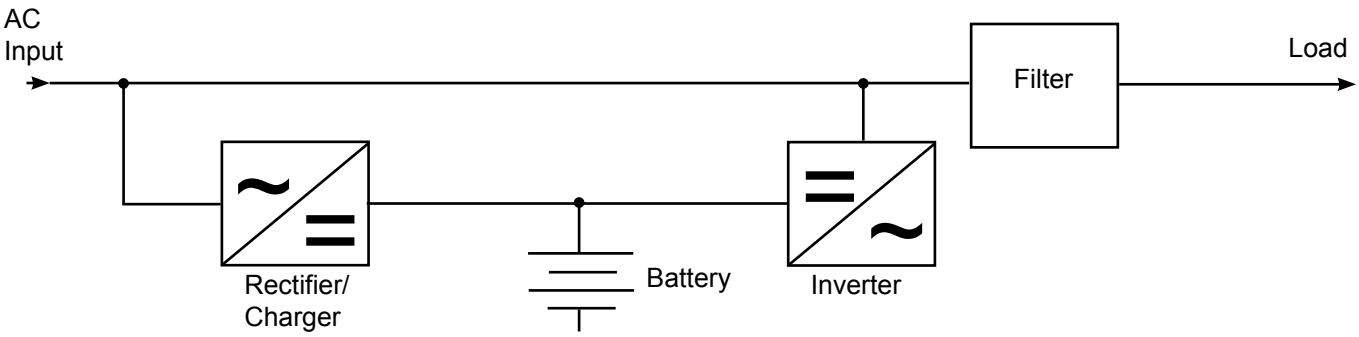
| Cable Size | Armoured Cable Free Air Wired | Unarmoured Cable Free Air Wired |
|---|---|---|
| 50mm2 | 150 Amps | 140 Amps |
| 70mm2 | 180 Amps | 175 Amps |
| 95mm2 | 225 Amps | 215 Amps |
| 120mm2 | 260 Amps | 250 Amps |
| 150mm2 | 290 Amps | 280 Amps |
| 185mm2 | 340 Amps | 330 Amps |
| 240mm2 | 400 Amps | 385 Amps |

Most of the critical applications in data processing and other industries are now protected by Uninterruptible Power Supplies (UPS).
It is essential that the different types and performance levels are covered by international standards (IEC).
UPS systems are intended to improve the quality of AC power and provide a redundant (back-up) power source.
Power quality defects which may be improved by a UPS include surges, noise or sags.



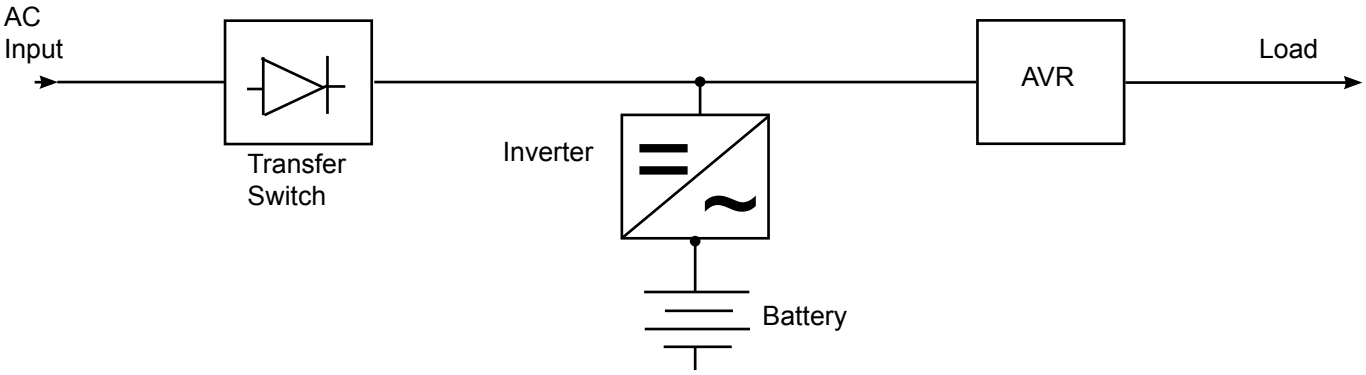

In this type of UPS the load is isolated from the mains, hence all the power to the load flows through the inverter, offering continuous protection and full isolation against surges, noise and sags. It offers true on line protection.

**Simplified Diagram of an "Offline" UPS**




This type of UPS is not suitable for all applications because it does not use a static switch bypass and the switching times are longer.
There is no isolation between the load and the mains. There is also no output frequency control.

**Simplified Diagram of an "Line-Interactive" UPS**




This type of UPS does not provide isolation between the mains and the load. There is poor protection against spikes and poor efficiency.
There is no output frequency control but it has voltage regulation on the output.

# UPS - LINE INTERACTIVE
MODIFIED SINEWAVE

## T1X SERIES (650VA-2kVA)

- Compact size
- Excellent microprocessor control guarantees high reliability
- Boost and buck AVR for voltage stabilisation
- Auto restart with AC recovery
- Simulated sinewave inverter output
- Off-mode charging
- Cold start function
- USB comm. standard with RJ11 telephone protection.

| Model | ST1006X | ST1010X | ST1015X | ST1020X |
|---|---|---|---|---|
| Capacity | 650VA/360W | 1000VA/600W | 1500VA/900W | 2000VA/1200W |
| **Input** | | | | |
| Voltage | 110/120VAC or 220/230/240VAC | | | |
| Voltage Range | 81-145VAC or 162-290VAC | | | |
| Frequency Range | 50Hz or 60Hz (auto-sensing) | | | |
| **Output** | | | | |
| Ac Voltage Regulation (Batt. Mode) | ± 10% | | | |
| Frequency Range (Batt. Mode) | 50Hz or 60Hz ± 1Hz | | | |
| Transfer Time | Typical 1-6ms, 10ms Max | | | |
| **Battery** | | | | |
| Battery Type & Number | 12V/7Ah x 1 | 12V/7Ah x 2 | 12V/9Ah x 2 | |
| Backup Time (1 PC @ 120W load) | 10 min. | 30 min. | 40 min. | 42 min. |
| Typical Recharge Time | 4-6 hours recovery to 90% | | | |
| **Indicators** | | | | |
| AC Mode | Green LED on | | The right green LED is on and LED's 2-5 indicate load level | |
| Battery Mode | Green LED Flashes | Yellow LED Flashes | The right green LED flashes and LED's 2-5 indicate battery capacity | |
| Fault | Red LED Flashes | | | |
| **Protection** | | | | |
| Full Protection | Overload, discharge and overcharge protection | | | |
| **Alarm** | | | | |
| Battery Mode | Sounds every 10 seconds | | | |
| Low Battery | Sounds every second | | | |
| Overload | Sounds every 0.5 seconds | | | |
| Battery Replacement Alarm | Sounds every 2 seconds | | | |
| Fault | Continuously sounds | | | |
| **Physical** | | | | |
| Dimension, D x W x H (mm) | 287 x 100 x 142 | 350 x 146 x 160 | 230 x 500 x 280 | |
| Net Weight (kg) | 4.25 | 8.0 | 11.1 | 11.5 |
| **Operating Environment** | | | | |
| Humidity | 0-90% RH @ 0-400C (non-condensing) | | | |
| Noise | Less than 40dB | | | |

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Specification or design can be changed at anytime without prior notice.

# UPS - LINE INTERACTIVE
MODIFIED SINEWAVE

## T1 SERIES (500VA-1kVA)

- Compact and stylish, ideal for office or home
- Excellent performance and reliability, designed for maximum equipment protection
- Advanced MCU control technology, enhancing UPS performance
- 500VA, 700VA and 1kVA, powerful enough for desktop PC's
- Conforms to all necessary safety and CE specifications
- No noise, place it on your desktop
- Simple, easy to read LCD display
- Fast, low voltage protection buck and boost
- Predicting mains failure
- Automatic voltage regulation saving battery power
- Low battery protection preventing deep discharge
- Advanced battery management
- Modem, phone line and peripheral equipment protection
- Hot battery swap, no need to switch off UPS (except for 1kVA).

| Model | ST1005 | ST1007 | ST1010 |
|---|---|---|---|
| Capacity | 500VA/300W | 700VA/420W | 1000VA/600W |
| **Input** | | | |
| Input Voltage Range | 220/230/240VAC (+25% / -30%) | | |
| Input Frequency | 44Hz ~ 56Hz | | |
| **Output** | | | |
| Output Voltage | 220/230/240VAC ± 10% (On Battery Mode) | | |
| Output Voltage Regulation | ± 10% | | |
| Output Frequency (Battery Mode) | 50 ± 0.1Hz | | |
| Overload Capability | Delayed protection when the output is > 150% overload | | |
| **Battery** | | | |
| Number of Batteries | 1 cell | 1 cell | 2 cells |
| Recharge Time to 90% | < 10 hours | | |
| **Transfer time** | | | |
| AC to DC | < typical 6 ms | | |
| **Indication** | | | |
| LCD | AC Mode, Battery Mode, Output Status, Battery Capacity, Overload, UPS Fault | | |
| **Audible Alarm** | | | |
| Battery Mode | Long beeping | | |
| Low Battery | Continuous beeping | | |
| Overload | Short beeping | | |
| **Dimensions** | | | |
| W x H x D (mm) | 90 x 165 x 325 | 90 x 165 x 325 | 120 x 210 x 380 |
| **Weight** | | | |
| Net Weight w/ Battery (kgs) | 6.3 | 6.6 | 15 |
| **Environmental** | | | |
| Operating Temperature | -5 ~ +400 C | | |
| Relative Humidity | < 90% (Non-Condensing) | | |
| Audible Noise | <45dBA @ 1 Meter | <50dBA @ 1 Meter | <55dBA @ 1 Meter |

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## T2 SERIES (1kVA-3kVA)

Launched in 2005 and superseding the highly regarded PHD IP Series UPS, the T2 Series benefits from the latest microprocessor Control Unit (MCU) technology, and now offers even greater value for money. The T2 is aimed at users that require protection from line voltage fluctuations and require a reliable and constant power source. The T2 is a sophisticated unit utilizing full digital control technology. Available with power rating of 1kVA, 2kVA and 3kVA each with LCD display and audible alarm keeping you quickly updated on mains and battery status. The T2 is also fitted with an intelligent test button enabling a self-test routine which also prevents the UPS from being inadvertently switched off.

### FEATURES:

- Extensive log files
- Scheduled battery and inverter testing
- Scheduled system shutdown/restart
- User-Customisable commands and messages
- Multiple UPS control from a single computer
- Remote Console Command module for remote multiple server shutdown
- Internal SNMP sub-agent for integration into existing NMS (e.g. HP OpenView, CA).

| Model | ST2010 | ST2020 | ST2030 |
|---|---|---|---|
| **Capacity** | | | |
| Maximum Capacity | 1000VA/700W | 2000VA/1400W | 3000VA/2100W |
| **Input** | | | |
| Input Voltage Range | 220/230/240VAC ± 25% Singe Phase w/Ground | | |
| Input Frequency | 44Hz ~ 56Hz | | |
| **Output** | | | |
| Output Voltage | 220/230/240VAC ± 2% | | |
| Output THD | < 3% | | |
| Efficiency (Battery Mode) | 82% | | |
| Output Frequency (Battery Mode) | 50 ± 0.1Hz | | |
| Overload Capability (Normal Mode) | Sustaining 5 min @ 100 – 200%; 3 sec @ > 200% | | |
| Overload Capability (Battery Mode) | Sustaining 30 sec @ > 100%; 1 sec @ 150% | | |
| **Battery** | | | |
| Number of Batteries | 2 cells | 4 cells | 6 cells |
| Recharge Time to 90% | < 8 hours (adjustable) | | |
| Charge Current of Long Standby Model * | 5A | | |
| **Indication** | | | |
| LCD | AC Mode, Battery Mode, Output Status, Battery Capacity, Overload, UPS Fault | | |
| **Audible Alarm** | | | |
| Battery Mode, Low Battery, Overload | Long beeping, Continuous beeping, Short beeping | | |
| **Physical** | | | |
| **Environmental** | | | |
| Operating Temperature | -5 ~40$^0$ C | | |
| Relative Humidity | < 95% (Non-Condensing) | | |
| Audible Noise | <45dBA @ 1 meter | | |
| Communication Port | Standard RS232; USB or SNMP/HTTP (optional) | | |

* All T2 models have a long standby option with no built in batteries, this is the charge current of the long standby models. For long standby models, add “-L“ to the part number.

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## T2R SERIES (2kVA-10kVA)

FEATURES:

- True Bi-Lateral Converter Line-interactive UPS
- Pure Sinewave and suitable for linear and non-linear loads
- Rack and Tower Convertible
- Standard and long backup time models available
- Multi-Interface slot for RS232, SNMP, USB, RS485, Modbus, Dry Contact and customised interfaces
- Various communication options selectable and all can be available at the same time
- Complete protection for overload, overheat, surges, spikes, short circuit and over charge
- Detachable two-way dialogue interactive dot-matrix LCD control panel
- Real time remaining backup time calculations
- User friendly, swappable battery replacement design
- Built-in powerful charger with power factor correction
- Emergency Power Off (EPO) available
- Intelligent fan speed control
- Cold start (DC start) function
- Compatible with generators.

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# UPS - LINE INTERACTIVE
## PURE SINEWAVE

| Model | ST2R20 | ST2R30 | ST2R50 | ST2R75 | ST2R100 |
|---|---|---|---|---|---|
| Capacity | 2kVA/1250W | 3kVA/1875W | 5kVA/3125W | 7.5kVA/4688W | 10kVA/6250W |
| **Input** | | | | | |
| Voltage | 220/230/240VAC | | | | |
| Voltage Range | 170VAC~300VAC | | | | |
| Frequency Range | 45Hz~70Hz Auto-Sensing | | | | |
| **Output** | | | | | |
| Voltage | 220/230/240VAC ± 3% settable on the LCD | | | | |
| Frequency Range | 50Hz or 60Hz ± 0.1Hz | | | | |
| Wave Form | Pure Sinewave | | | | |
| Efficiency (Line Mode / Battery Mode) | 98% / 80% | | | | |
| Overload (Line Mode) | > 110% Buzzer alarms and Amber LED blinks continuously | | | | |
| Overload (Batt. Mode) | 110%-150% for 30sec, > 150% for 200ms, then UPS shuts down | | | | |
| **Battery** | | | | | |
| Battery Voltage | 36Vdc | | 48Vdc | | |
| Battery Quantity | 3 x 9Ah | 6 x 7.2Ah | 8 x 9Ah | 16 x 7.2Ah * | 16 x 9Ah * |
| Charge Current of Long Standby Models ** | > 10A | | | | N/A |
| **Other** | | | | | |
| Transfer Time | < 4ms | | | | |
| Communication Interface | USB standard, RS232, RS485, SNMP, Dry Contact and AS400 available | | | | |
| **Physical and Environmental** | | | | | |
| Operating Temperature | 00C-400C | | | | |
| Relative Humidity | 0-95% non-condensing | | | | |
| Audible Noise | < 55dBA (@ 1m) | | | | |
| Dimensions (W x H x D, mm) | 440 x 88 x 465 | 440 x 132 x 465 | 440 x 132 x 620 | 440 x 132 x 465 (UPS), 440 x 132 x 465 (Battery Box) | |
| Weight (kg) | 24.5 | 36.9 | 49.8 | 34.6 (UPS only) | 36.6 (UPS Only) |
| IEC Outputs | 6 | 10 | 10 + 1 Terminal Block | 5 + 1 Terminal Block | |
| **Safety Standards** | | | | | |
| Safety | EN62040-1-1 | | | | |
| EMC | EN62040-2 | | | | |
| Marks | CE, UL, cUL | | | | |

* Batteries on these models are external to the UPS cabinet

** Models from 2kVA - 7.5kVA have long standby models available, add “-L” to the model no. Charge currents on these of up to 30A available on request.

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DUXBURY UPS

# UPS - LINE INTERACTIVE
PURE SINEWAVE [Long Standby]

## T2X SERIES (800W-8kW)

The Star T2X UPS is an All-In-One user friendly UPS, easy to handle, suitable and compatible for almost all Home/Office applications (Linear and non-linear loads including Air Conditioners!).

Being a line interactive UPS, it can produce clean and perfect PURE SINEWAVES, by providing the best power quality for all your electric equipment.

The traditional UPS supplies power only for a limited few minutes, the T2X can function as an efficient GENERATOR! With an Auto Transfer Switch, it can easily handle any critical power failure situations.

Also, the T2X Series has a powerful charger that can supply a capacity over 500 Ah, it can adapt itself and charge without any damage to any type of battery. Its Solar Power Server allows the UPS to work with solar panels to supplement the built in battery charger of the UPS.

The Star T2X Series: an ecologic solution for homes and offices!

| Features: | |
|---|---|
| ✓ | Multiple microprocessor design base |
| ✓ | Compatible with linear and non-linear load |
| ✓ | Stronger charger to support batteries 500AH and up |
| ✓ | 24 hours operation on the inverter |
| ✓ | Parameter presentable |
| ✓ | DC start and automatic self-diagnostic function |
| ✓ | THD less than 3% |
| ✓ | High efficiency design to save electricity |
| ✓ | Low heat dissipation in long time operation |
| ✓ | Designed to operate under harsh environment |
| ✓ | LCD Panel Control |
| ✓ | Controllable & Removable panel with LCD |
| ✓ | Wall Mounted Design or 19" Rack |

Powerful charger

Auto transfer switch

Pure sinewave

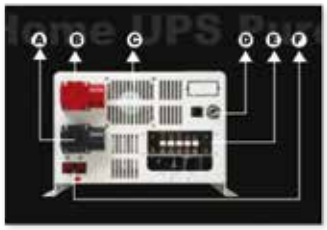
Sinewave inverter

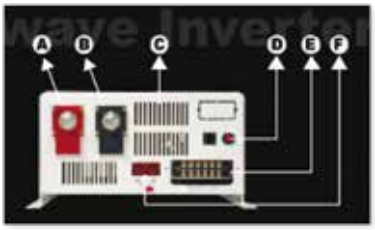
Solar power server

DUXBURY UPS

# UPS - LINE INTERACTIVE
## PURE SINEWAVE [Long Standby]

**A** Positive DC connector
**B** Negative DC connector
**C** Cooling Fan
**D** AC Output Fuse
**E** AC Output Terminal Block
**F** Solar Panel Input.



| | Model | | ST2008X | ST2010X | ST2020X | ST2040X | ST2060X | ST2080X |
|---|---|---|---|---|---|---|---|---|
| Capacity | Watt/Amps | | 800W/3.6A | 1600W/7.2A | 2400W/10.9A | 4000W/18.1A | 6000W/27.2A | 8000W/36.3A |
| Input | Normal Voltage | | 220Vac / 110Vac | | | | | 220Vac |
| | | Acceptable Voltage | 120-275Vac / 60-135Vac | | | | | 120Vac-275Vac |
| | | Frequency | 50Hz / 60Hz (45Hz- 70Hz) | | | | | |
| | Voltage Range | Line Low Transfer | 120Vac +-2% /60VAC +- 2% | | | | | 120Vac+-2% |
| | | Line Low Return | 130Vac +-2% /65Vac +-2% | | | | | 130Vac+-2% |
| | | Line High Transfer | 275Vac +-2% / 135Vac +-2% | | | | | 275Vac+-2% |
| | | Line High Return | 260Vac+-2% / 130Vac +-2% | | | | | 260Vac+-2% |
| Output | Voltage | | 220Vac (230V or 240 Vac re-settable via LCD panel); 110Vac (115V or 120Vac re-settable via LCD panel) | | | | | 230Vac (220V or 240Vac re-settable via LCD panel) |
| | Voltage Regulation (Batt Mode) | | <3% RMS for entire battery voltage range | | | | | |
| | Frequency | | 50Hz or 60 Hz | | | | | |
| | Frequency Regulation (Batt Mode) | | +-0.1 Hz | | | | | |
| | Power Factor | | 0.67 | | | 0.6 | | 0.62 |
| Transfer Time | Waveform | | Pure Sinewave | | | | | |
| | Typical | | < 8ms | | | | | |
| Battery | Battery Voltage | | 12Vdc | 24Vdc | | | 48Vdc | |
| | Backup Time (at full load) | | Long time available | | | | | |
| | Max Charging Current (3 steps selectable ) | | >40A | >50A | | >60A | | |
| Solar Power | Solar Power Server 50A (Option) | | Optional* | | | Standard | | |
| Display LCD | LCD Extended LCD Remote Control (optional) | | UPS status,I/P &O/P Voltage Frequency, Load%, Battery Voltage & %, Temperature, Model | | | | | |
| | LED | | Normal (Green), Warning (Yellow), Fault (Red) | | | | | |
| Audible Alarm | Battery Mode | | Beeping every 4 seconds | | | | | |
| | Low Battery | | Beeping every second | | | | | |
| | UPS Fault | | Beeping Continuously | | | | | |
| | Overload | | Beeping twice per second. UPS will shutdown automatically in 30 seconds if overload is over 105~ 150% and up to 150 % will shutdown immediately. | | | | | |
| Environ-ment | Operation Temperature | | 0-40 degree C; 32-104 degree F | | | | | |
| | Relative Humidity | | 0-95% non-condensing | | | | | |
| | Audible Noise | | Less than 55dBA (at 1M) | | | | | |
| Physical | Net Weight (Kgs) | | 14 | 21 | 23 | 49.2 | 51.4 | 53.6 |
| | Dimension (WxHxD)mm Rack Mount | | 440*132*290 | 440*132*360 | 440*132*360 | N/A | N/A | N/A |
| | Wall Mounted(W*H*D)mm | | 298*400*150 | 298*450*190 | 298*450*190 | 415*600*260 | 415*600*260 | 415*600*260 |

*** Add "S" to the part number for the solar server option**

Different specifications required are available
All specifications mentioned above are subject to change without prior notice.

# UPS - ONLINE (TRANSFORMERLESS)
## 1 PHASE INPUT, 1 PHASE OUTPUT

## T3 SERIES (1kVA-10kVA)

The T3 is a physically small On-Line double conversion UPS but retains all the features normally associated with On-Line technology, but what is On-Line double conversion technology and why does it matter? Simply put “double conversion” is where the mains supply is rectified to a clean DC voltage and rebuilt into a very clean and regulated AC voltage, at all times your critical load runs from this clean no break supply.

Line-Interactive and Off-Line UPS’s are single conversion, put in its crudest form your computer runs on semi regulated mains and will always suffer a small break in supply whilst the UPS moves from mains mode to battery mode in a mains fail situation.

### PARALLEL

A big advantage offered by the T3 6kVA to 10kVA is that by means of a simple cable the machines can be linked together to form a parallel N+1 system. This offers the client the opportunity to be either a fail safe system or the option to expand the power as the network grows. Up to three machines can be connected in this way making the T3 a flexible and versatile solution.

### UPS MANAGEMENT SOFTWARE

The UPS management software is installed on a server or workstation connected to each UPS via the serial or USB port. Power failure, power restored, battery failure or eight events will be detected and the user informed. A shutdown will be initiated when the batteries are exhausted or a technical problem occurs with the UPS. The UPS management software disconnects, logs out users and closes open applications(subject to application/ operating system support) before shutting down the operating system itself.

### SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)

The T3 SNMP external agent can be located up to 5 metres away from the UPS. Initial configuration is carried out by serial comms using any suitable terminal application (e.g. Hyperterminal for Windows).

The embedded HTTP server presents an HTML interface to the network, which can be accessed from any web browser.
All system parameters can be configured from here including scheduled shutdown. A sophisticated JAVA applet provides full monitoring in real time, along with comprehensive events and history logs.

- **TRUE ON-LINE DOUBLE TECHNOLOGY FOR HIGH LEVEL OF PROTECTION**
- **DSP TECHNOLOGY (FOR 6-10kVA MODELS)**
- **PARALLEL REDUNDANCY CAPABILITY (FOR 6-10kVA MODELS AS STANDARD)**
- **INTEGRATED SMARTCARD SLOT PROVIDING A CHOICE OF COMMUNICATIONS INTERFACES**
- **OPTIONAL SPECIALISED UPS MANAGEMENT SOFTWARE**
- **USER FRIENDLY LCD DISPLAY**
- **FAILSAFE INTERNAL BYPASS**
- **SWITCH WITH MANUAL CONTROL**
- **LONG RUNTIME AVAILABILITY.**

DUXBURY UPS

# UPS - ONLINE (TRANSFORMERLESS)

## 1 PHASE INPUT, 1 PHASE OUTPUT

| Model | ST3010 | ST3020 | ST3030 | ST3060 | ST3100 |
|---|---|---|---|---|---|
| Topology | True On-Line, Double Conversion | | | | |
| On-battery Waveform | Pure Sine Wave | | | | |
| **Input** | | | | | |
| Maximum Capacity (VA/W) | 1000VA/800W | 2000VA/1600W | 3000VA/2400W | 6000VA/4800W | 10000VA/8000W |
| Nominal Input | 230VAC | | | | |
| Input Voltage Regulation | 160~300 VAC Single Phase w/ Ground | | | 170~285 VAC Single Phase w/Ground | |
| Nominal Input Frequency | 50/60 ± 4Hz | | | | |
| Input PFC | ≥0.95 | | | ≥0.98 | |
| Input Short Protection | Circuit Breaker | | | | |
| **Output** | | | | | |
| Nominal Output | 220/230/240 VAC nominal | | | | |
| Output Regulation | ± 2% | | | ± 1% | |
| Output T.H.D | ≤3% (Linear Load)<br>≤6% (Non-Linear Load) | ≤4% THD (Linear Load)<br>≤7% THD (Non-Linear Load) | | ≤2% THD (Linear Load)<br>≤6% THD (Non-Linear Load) | |
| High Efficiency Mode (AC to DC) | 85% | 85% | 88% | > 88% | |
| High Efficiency Mode (DC to AC) | 83% | 83% | 83% | > 88% | |
| Crest Factor | 3:1 | | | | |
| Start on Battery | Yes | | | | |
| Output Frequency | 50 Hz ± 0.2 Hz | | | 50 Hz ± 0.5 Hz | |
| **Battery** | | | | | |
| Typical Backup Time (at full load) | 9 minutes | 12 minutes | 8 minutes | 10 minutes | 8 minutes |
| Battery Type | Sealed Lead-Acid maintenance-free 12VDC/7Ah per cell | | | | 12VDC/9Ah per cell |
| Number of Batteries | 3 cells | 8 cells | | 20 cells | |
| Recharge Time to 90% | 5 hours | | | 7 hours | 8 hours |
| Charge Current of Long Standby Model * | 8A | | | 4.2A ** | |
| **Advanced Warning Diagnostics** | | | | | |
| Front Panel Indication – LCD | UPS Status, I/P Voltage & Frequency, O/P Voltage & Frequency,<br>Battery Voltage, Battery Capacity, Loading %, Temperature, History Alarm. | | | | |
| Front Panel Indication – LED | Normal (Green), Warning (Yellow), Fault (Red) | | | | |
| Audible Alarms | Battery Mode, Low Battery, Overload, Fault | | | | |
| **Communication Interface** | | | | | |
| Communication Port | RS232 (Standard), DB9 or USB or AS400 or SNMP / HTTP (Optional) | | | | |
| **Environmental** | | | | | |
| Audible Noise | < 45dBA @1 meter | < 50dBA @1 meter | | < 55dBA @1 meter | |
| **Mechanical** | | | | | |
| Dimensions (W x H x D mm) | 160 x 220 x 400 | 200 x 352 x 450 | | 260 x 717 x 570 | |
| Weight (Net Weight with Battery) (kgs) | 15 | 34 | 35 | 90 | 93 |

* All T3 models have a long standby option with no built in batteries, this is the charge current of the long standby models. For long standby models, add "-L" to the part number.

** 6 and 10kVA models can have up to 25A charging capabilities when connected in parallel with the ST-CHARGER external super charger.

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# UPS - ONLINE (TRANSFORMER)
## 1 PHASE INPUT, 1 PHASE OUTPUT

## T3T SERIES (10kVA - 15kVA)

The T3T is a transformer isolated On-Line double conversion UPS but what is On-Line double conversion technology and why does it matter? Simply put “double conversion” is where the mains supply is rectified to a clean DC voltage and rebuilt into a very clean and regulated AC voltage, at all times your critical load runs from this clean no break supply and is isolated from the input.

Line-Interactive and Off-Line UPS’s are single conversion, put in its crudest form your computer runs on semi regulated mains and will always suffer a small break in supply whilst the UPS moves from mains mode to battery mode in a mains fail situation.

### PARALLEL

A big advantage offered by the T3T is that by means of a simple cable the machines can be linked together to form a parallel N+1 system (only for 10kVA and 15kVA models). This offers the client the opportunity to be either a fail safe system or the option to expand the power as the network grows. Up to three machines can be connected in this way making the T3T a flexible and versatile solution.

### UPS MANAGEMENT SOFTWARE

The UPS management software is installed on a server or workstation connected to each UPS via the serial or USB port. Power failure, power restored, battery failure or eight events will be detected and the user informed. A shutdown will be initiated when the batteries are exhausted or a technical problem occurs with the UPS. The UPS management software disconnects, logs out users and closes open applications(subject to application/operating system support) before shutting down the operating system itself.

### SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)

The T3T SNMP external agent can be located up to 5 metres away from the UPS. Initial configuration is carried out by serial comms using any suitable terminal application (e.g. Hyperterminal for Windows).

The embedded HTTP server presents an HTML interface to the network, which can be accessed from any web browser. All system parameters can be configured from here including scheduled shutdown. A sophisticated JAVA applet provides full monitoring in real time, along with comprehensive events and history logs.

- **TRUE ON-LINE DOUBLE CONVERSION TECHNOLOGY FOR HIGH LEVEL OF PROTECTION**
- **DSP TECHNOLOGY**
- **PARALLEL REDUNDANCY CAPABILITY (OPTIONAL)**
- **INTEGRATED SMARTCARD SLOT PROVIDING A CHOICE OF COMMUNICATIONS INTERFACES**
- **OPTIONAL SPECIALISED UPS MANAGEMENT SOFTWARE**
- **USER FRIENDLY LCD DISPLAY**
- **FAILSAFE INTERNAL BYPASS**
- **SWITCH WITH MANUAL CONTROL**
- **LONG RUNTIME AVAILABILITY.**

DUXBURY UPS

# UPS - ONLINE (TRANSFORMER)
## 1 PHASE INPUT, 1 PHASE OUTPUT

| Model* | ST3020T | ST3030T | ST3050T | ST3060T | ST3100T | ST3150T |
|---|---|---|---|---|---|---|
| Topology | True Online Double Conversion, Isolated Transformer Output | | | | | |
| **Input** | | | | | | |
| Maximum Capacity (kVA/kW) | 2/1.4 | 3/2.1 | 5/3.5 | 6/4.2 | 10/7 | 15/10.5 |
| Input Voltage Regulation | 220VAC ±25% | | | | | |
| Nominal Input Frequency | 50Hz ± 5% | | | | | |
| Battery Voltage | 48VDC | 96VDC | 192VDC | | | |
| **Output** | | | | | | |
| Output Regulation | 220VAC ± 2% | | | | | |
| Waveform | Sinewave, ≤3% THD | | | | | |
| Switch Time | 0ms | | | | | |
| Overload Capacity | 125% for 60 seconds, 150% for 0.5 seconds | | | | | |
| Crest Factor | 3:1 | | | | | |
| Start on Battery | Yes | | | | | |
| Output Frequency | Automatic synchronous tracing when power supply normal, at 50Hz ± 0.5% when power supply abnormal | | | | | |
| **Battery** | | | | | | |
| Back up time** | 15 mins | 25 mins | 10 mins | 10 mins | Any backup time | |
| Battery efficiency | >80% | >87% | | | >89% | |
| Charging*** | Intellectual MMBM battery control technique, unique multi-charging mode improving the reliability and lengthening the life of the batteries | | | | | |
| **Other Features** | | | | | | |
| Panel Display | Input voltage, Output voltage, Load capacity, Battery voltage LED indicating lights show the working status | | | | | |
| Alarm | Mains supply abnormal, Low battery, Overload | | | | | |
| Protection Function | Protection for low battery, overload, over temperature, short circuit, output over voltage, output low voltage | | | | | |
| Parallel function* | N/A | | | | Random extending or N+1 redundancy parallel connection | |
| **Communication Interface** | | | | | | |
| Communication Function | RS232 communication port supports UPSilon 2000 software (standard). Supports SNMP adapter for network management (optional). | | | | | |
| Remote Control (Optional) | Independent digital remote control at the distance of 1000 meters supported by RS485, which supports remote monitoring | | | | | |
| Dry connection | The port allows a 2A current, convenient and safe | | | | | |
| **Environmental** | | | | | | |
| Audible Noise | < 55dBA @1 meter | | | | < 60dBA @1 meter | |
| Work Temperature, Relative Humidity | 0~400C, 0~95%(no condensation) | | | | | |
| Altitude | Meet GB/T 7260.3-2003 standard | | | | | |
| **Mechanical** | | | | | | |
| Dimensions (W x L x H mm) | 230 x 620 x 470 | 230 x 635 x 690 | | | 400 x 800 x 1180 | |
| Weight (with & without batteries) (kgs) | 65/52 | 82/58 | 90/57 | 108/61 | 210/92 | 250/140 |

* T3T10kVA and 15kVA models have a parallel redundant option, add "-P" to the part number.
** T3T 2kVA-15kVA models have a long standby option with no built in batteries, add "L" to the part number for these models.
***5-15kVA models can have up to 15A charging capabilities when connected in parallel with the ST-CHARGER external super charger.

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# UPS - ONLINE (TRANSFORMERLESS)
## 1 PHASE INPUT, 1 PHASE OUTPUT

## T3R SERIES (1kVA-10kVA)

With ever greater demands being made on valuable floor space, many IT managers are moving towards computer rack solutions rather than conventional floor standing options offered in the past. The same philosophy has affected the UPS industry with many UPS now being located with the computer inside the rack cabinet. On-Line UPS have historically been handicapped in this particular market sector, essentially for two reasons, size and price. Most IT managers have dealt with this problem by moving to Line-Interactive and Off-Line topologies. As these technologies have fewer fail safe features and for the most part only work when a problem occurs. With the introduction of the T3R series these past limitations are no longer valid.

The T3R is a physically small On-Line double conversion UPS but retains all the features normally associated with On-Line technology, but what is On-Line double conversion technology and why does it matter? Simply put, “double conversion” is where the mains supply is rectified to a clean DC voltage and rebuilt into a very clean and regulated AC voltage, at all times your critical load runs from this clean no break supply. Line-Interactive and Off-Line UPS are single conversion, put in its crudest form, your computer runs on semi regulated mains and will always suffer a small break in supply whilst the UPS moves from mains mode to battery mode in a mains fail situation. The T3R offers a competitive price, even against the more basic technologies, but unlike these technologies you will get as standard an LCD screen, RS232, USB port options, battery extension options, battery monitoring, no-break supply, static switch, wide voltage input without using batteries, optional software, comms slot for SNMP, Relays or Optocoupler.

### SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)

The T3R SNMP external agent can be located up to 5 metres away from the UPS. Initial configuration is carried out by serial comms using any suitable terminal application (e.g. Hyperterminal for Windows). The embedded HTTP server presents an HTML interface to the network, which can be accessed from any web browser. All system parameters can be configured from here including scheduled shutdown. A sophisticated JAVA applet provides full monitoring in real time, along with comprehensive events and history logs.

### UPS MANAGEMENT SOFTWARE

The UPS management software is installed on a server or workstation connected to each UPS via the serial or USB port. Power failure, power restored, battery failure or eight events will be detected and the user informed. A shutdown will be initiated when the batteries are exhausted or a technical problem occurs with the UPS. The UPS management software disconnects, logs out users and closes open applications(subjet to app/os support) before shutting down the operating system itself.

- **EXTENSIVE LOG FILES**
- **SCHEDULED BATTERY AND INVERTER TESTING**
- **SCHEDULED SYSTEM SHUTDOWN/RESTART**
- **USER-CUSTOMISABLE COMMANDS AND MESSAGES**
- **MULTIPLE UPS CONTROL FROM A SINGLE COMPUTER**
- **REMOTE CONSOLE COMMAND MODULE FOR REMOTE MULTIPLE SERVER SHUTDOWN**
- **INTERNAL SNMP SUB-AGENT FOR INTEGRATION INTO EXISTING NMS (E.G. HP OPENVIEW, CA UNICENTER.**

DUXBURY UPS

# UPS - ONLINE (TRANSFORMERLESS)

## 1 PHASE INPUT, 1 PHASE OUTPUT

| Model | ST3R10 | ST3R20 | ST3R30 | ST3R60 | ST3R100 |
|---|---|---|---|---|---|
| Topology | True On-Line, Double Conversion | | | | |
| Output Waveform | Pure Sine Wave | | | | |
| **Input** | | | | | |
| Maximum Capacity (VA/W)** | 1000VA/800W | 2000VA/1600W | 3000VA/2400W | 6000VA/4800W | 10000VA/8kW |
| Nominal Input Voltage | 230 VAC | | | | |
| Input Regulation Voltage | 160~300 VAC Single Phase w/ Ground | | | 160~300 VAC Single Phase w/ Ground | |
| Nominal Input Frequency | 50/60 ± 4Hz | | | | |
| Input PFC | ≥0.95 | | | ≥0.98 | |
| Input Short Protection | Circuit Breaker | | | | |
| **Output** | | | | | |
| Nominal Output Voltage | 220/230/240 VAC nominal | | | | |
| Output Voltage Regulation | ± 2% | | | | |
| Output T.H.D | ≤3% (Linear Load)<br>≤6% (Non-Linear Load) | ≤4% THD (Linear Load)<br>≤7% THD (Non-Linear Load) | | ≤2% THD (Linear Load)<br>≤6% THD (Non-Linear Load) | |
| High Efficiency Mode (AC to DC) | 85% | 85% | 88% | > 88% | |
| High Efficiency Mode (DC to AC) | 83% | 83% | 83% | > 88% | |
| Crest Factor | 3:1 | | | | |
| Start on Battery | Yes | | | | |
| Output Frequency | 50 Hz ± 0.2 Hz | | | 50 Hz ± 0.5 Hz | |
| **Battery** | | | | | |
| Typical Backup Time | 9 minutes | 12 minutes | 8 minutes | 10 minuts | 8 minutes |
| Battery Type | Sealed Lead-Acid maintenance-free 12VDC/7Ah per cell | | | | 12VDC/9Ah per cell |
| Number of Batteries | 3 cells | 8 cells | | 20 cells | |
| Recharge Time to 90% | 5 hours | | | 7 hours | 8 hours |
| Charge Current of Long Standby Model * | 8A | | | 4.2A ** | |
| **Advanced Diagnostics** | | | | | |
| Front Panel Indication – LCD | UPS Status, I/P Voltage & Frequency, O/P Voltage & Frequency, Battery Voltage, Battery Capacity, Loading %, Temperature, History Alarm. | | | | |
| Front Panel Indication – LED | Normal (Green), Warning (Yellow), Fault (Red) | | | | |
| Audible Alarms | Battery Mode, Low Battery, Overload, Fault | | | | |
| **Communication Interface** | | | | | |
| Communication Port | RS232 (Standard), DB9 or USB or AS400 or SNMP / HTTP (Optional) | | | | |
| **Environmental** | | | | | |
| Operation Temperature | 0-400 C | | | | |
| Storage Temperature | -150C to 500C | | | | |
| Relative Humidity | 20% to 90% non-condensing | | | | |
| Audible Noise | < 45 dBA @ 1 meter | < 50 dBA @ 1 meter | | < 55 dBA @ 1 meter | |
| **Mechanical** | | | | | |
| Dimensions (W x H x D mm) | 440 x 88 x 465 (with internal batteries) | 440 x 88 x 465 (UPS only)<br>440 x 88 x 465 (External Battery) | | 440 x 132 x 640 (UPS Only)<br>440 x 132 x 640 (External Battery) | |
| Weight (Net Weight with Batteries) (kgs) | 15.5 | 35 | 36 | 85 | 88 |

* All T3R models have a long standby option with no built in batteries, this is the charge current of the long standby models. For long standby models, add "-L" to the part number.

** 6 and 10kVA models can have up to 25A charging capabilities when connected in parallel with the ST-CHARGER external super charger.

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# UPS - ONLINE (TRANSFORMERLESS)
## 1 PHASE INPUT, 1 PHASE OUTPUT

## FP SERIES (1kVA-6kVA)

The FP series UPS is a true on-line double conversion UPS offering rack and tower placements. It is a reliable and effective system to protect critical systems from power outages and sags. The FP series is designed for optimising power quality with the ease of installation.

### APPLICATIONS

- Computers
- Network Servers
- Workstations
- Wireless Communications
- Other Electronic Peripherals.

### FEATURES:

- ***Flexible Mounting Orientation:*** Allows system integrators more flexibility in designing their backup power system to maximize space. With the rotatable LCD design, installers can mount the UPS vertically or horizontally.
- ***User-Friendly Graphic LCD:*** This robust LCD display enables field service engineers to easily troubleshoot the UPS without opening the box, thus reducing downtime.
- ***Single Voltage Battery Pack Design:*** A 48VDC standard battery pack design comprised of 4 x 12V7AH is used in all FP series UPS models and is interchangeable with each other.
- ***Hot-Swappable Battery:*** The standard 48VDC battery pack allows installers to take the headache out of battery installation. Installers can now simply slide the used battery pack out of the unit and replace it with a new pack. All FP battery packs are interchangeable reducing the risk of system failures.
- ***Light Weight Design:*** The FP model is specifically designed for field installation. The light weight design requires only a single installer to put the system in place. This will significantly reduce on-the-job injuries and installation fees.
- ***User-Remote Interface / Cruiser:*** The off-site user can now test, set parameters, monitor power status, save file, and shutdown the system all via remote inerface. The user-remote interface includes SNMP/HTTP Card, RS232, USB, DB9, and AS400 interface.

### STANDARD ACCESSORIES

- ***Mounting Feet:*** Two (2) mounting feet for tower configuration are supplied with the FP Series UPS 1KVA to 1.6KVA.
  All other models 2.2KVA to 3.2KVA are self supporting.
- ***Racking Ears:*** Standard 19” rack mounting ears are available for all FP Series UPS models.

- **TRUE ON-LINE DOUBLE CONVERSION TECHNOLOGY FOR HIGH LEVEL OF PROTECTION**
- **CONTINUOUS BATTERY CHARGER AND INVERTER FOR PRIMARY POWER PATH**
- **CONSTANT BATTERY CONNECTION TO INVERTER AND LOAD**
- **GUARANTEES FULL POWER OPERATION DURING POWER FAILURE**
- **NO VOLTAGE DROP AND ZERO TRANSFER TIME**
- **LIGHT WEIGHT UNIT**
- **HOT-SWAPPABLE BATTERY**
- **USER-FRIENDLY GRAPHIC LCD DISPLAY**
- **FLEXIBLE MOUNTING ORIENTATION**
- **ROTATABLE LCD DISPLAY FOR TOWER OR 19” RACK CONCEPT**
- **USER REMOTE INTERFACE/CRUISER.**

DUXBURY UPS

# UPS - ONLINE (TRANSFORMERLESS)
## 1 PHASE INPUT, 1 PHASE OUTPUT

| Model | FP1600 | FP2500 | FP3200 | FP6000 |
|---|---|---|---|---|
| Topology | True On-Line, Double Conversion | | | |
| On-battery Waveform | Pure Sine Wave | | | |
| **Input** | | | | |
| Maximum Capacity (VA/W) | 1600VA / 1120W | 2500VA / 1750W | 3200VA / 2240W | 6000VA / 4200W |
| Nominal Input (Voltage Regulation) * | 230VAC (160VAC-276VAC) | | | |
| Nominal Input Frequency | 50/60 ± 5Hz | | | |
| Input PFC | > 0.98 @ Full Load | | | |
| Input Short Protection | Circuit Breaker | | | |
| **Output** | | | | |
| Nominal Output (Voltage Regulation) | 208/220/230/240 VAC nominal (Rated Voltage ± 2%) | | | |
| Output T.H.D | < 3% @ Linear Load | | | |
| High Efficiency Mode (AC to AC) | > 88% | | | 90% |
| Crest Factor | 3 : 1 | | | |
| Output Frequency | 50 / 60Hz (Autotracking) | | | |
| Overload Capability | Sustaining 50sec @ 108% Load; 28sec @ 110-120% Load; 15sec @ 120-130% Load; 9sec @ 140-145% Load; Immediate Response @ 150% Load | | | |
| **Battery (Extendible in 2U High Modules) **** | | | | |
| User Replaceable Battery | 48V (1 x 48VDC Battery Pack) | 96V (2 x 48VDC Battery Pack) | 96V (2 x 48VDC Battery Pack) | 96V (2 x 48VDC Battery Pack) |
| Typical Backup Time (Full / Half Load) | 7 / 18 min | 8 / 20 min | 6 / 17 min | 4 / 10 min |
| Battery Type | Sealed VRLA 12V7Ah; Hot Swap | | | |
| Recharge Time to 90% | 8 hours | | | 4 hours |
| **Advanced Warning Diagnostics** | | | | |
| Front Panel Indication | Front panel menu driven LCD monitoring and control panel for all functions | | | |
| Audible Alarms | DC Mode, Low battery, Voltage / Frequency Error, Charger Fail, High Temp, Overload, Fault, PFC Overload | | | |
| **Communication Interface** | | | | |
| Communication Port | RS232 (Standard), DB9 or USB or AS400 or SNMP / HTTP (Optional), SNMP (Optional) | | | |
| **Environmental** | | | | |
| Operation Temperature | 0 ~ +40$^0$C | | | |
| Storage Temperature | -15 ~ +50$^0$C | | | |
| Relative Humidity | 0% - 95% non-condensing | | | |
| Audible Noise | < 45dBA @ 1 meter from surface of the unit | | | |
| **Mechanical** | | | | |
| Dimensions (W x H x D mm) - Rack Position | 426 x 88 x 500 | 426 x 176 x 500 | 426 x 88 x 500 | 426 x 176 x 500 |
| Weight (UPS / Battery Packs) | 12kg / 11.2kg | 13.2kg / 31.2kg | 13.4 / 31.4kg | 16kg / 31.4kg |
| **Conformance** | | | | |
| EMI / RFI Compatibility | EN50091-2 Class B, EN55022B | | | |
| Safety Certifications | CE, TUV / GS | | | |

* 10V systems available on request
** Each battery module comprises 2 x 48VDC battery packs in a 2U box.

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# UPS - ONLINE (TRANSFORMERLESS)
## 3 PHASE INPUT, 1 PHASE OUTPUT

## T4 SERIES (10kVA-20kVA)

The T4 is a physically small On-Line UPS but retains all the features normally associated with double conversion technology. Simply put "double-conversion" is where the mains supply is rectified to a DC voltage and rebuilt into a very clean and regulated AC voltage, at all times your critical load runs from this clean no break supply.

### PARALLEL

A big advantage offered by the T4 10kVA to 20kVA is that by means of a simple cable the machines can be linked together to form a parallel N+1 system. This offers the client the opportunity to either have a fail safe system or the option to expand the power as the network grows. Up to three machines can be connected in this way making the T4 a flexible and versatile solution.

### ULTRA COMPACT

With a very small footprint you will find a ready home for the T4 in even the most hard-pressed data center. Installing such a compact free-standing UPS avoids taking up valuable rack space without significantly reducing the available floor area.

### DISPLAY PANEL

LCD display and audible alarms actively let you know if the unit is on battery, the battery charge is low, or there is an overload condition. Loading and battery information via the LCD prevent you from exceeding the UPS capacity and allow you to assess the remaining runtime before battery reserves are depleted.

### ADVANCED BATTERY MANAGEMENT

A variable boost charger ensures quick battery recharge. This means that the T4 UPS is fully prepared for duty with a minimum recovery time in the event of a power failure. Active battery management intelligently monitors the battery set with automatic battery and circuitry self-tests, this feature increases both battery life and system reliability.

### UPS MANAGEMENT

One standard management tool can be used to monitor and control all your UPS's from one central location. This means power management can now be integrated into your existing network or building management strategy. Alarms ('traps') can be configured to ensure automatic notification of events such as low battery, mains failure or overload. Two such tools can be used with the T4: Simple Network Management Protocol (SNMP) and UPS Management Software via RS232.

- **TRUE ON-LINE DOUBLE CONVERSION TECHNOLOGY FOR ULTIMATE POWER PROTECTION**
- **DSP TECHNOLOGY**
- **PARALLEL REDUNDANCY CAPABILITY AS STANDARD**
- **IGBT INVERTER TECHNOLOGY**
- **SNMP/HTTP OPTION FOR REMOTE MANAGEMENT & INTEGRATION INTO NMS**
- **SMART RS232 AS STANDARD**
- **INTEGRATED SMARTCARD SLOT PROVIDING A CHOICE OF COMMUNICATIONS INTERFACES**
- **OPTIONAL SPECIALISED UPS MANGEMENT SOFTWARE**
- **USER FRIENDLY LCD DISPLAY**
- **FAILSAFE INTERNAL BYPASS SWITCH WITH MANUAL CONTROL**
- **LONG RUNTIME AVAILABILITY.**

DUXBURY UPS

# UPS - ONLINE (TRANSFORMERLESS)
## 3 PHASE INPUT, 1 PHASE OUTPUT

| Model | ST4100 | ST4150 | ST4200 |
|---|---|---|---|
| Topology | True On-Line, Double Conversion | | |
| On-battery Waveform | Pure Sine Wave | | |
| **Input** | | | |
| Maximum Capacity (kVA/kW) | 10kVA/8kW | 15kVA/12kW | 20kVA/16kW |
| Nominal Input Voltage | 380VAC Three Phase (3 Φ 4W + G) | | |
| Input Voltage Regulation | 304 ~ 478 VAC | | |
| Nominal Input Frequency | 50/60 ± 4Hz | | |
| Input PFC | ≥0.95 @ full load | | |
| Input Short Protection | 50A Circuit Breaker | 100A Circuit Breaker | |
| **Output** | | | |
| Nominal Output Voltage | 220/230/240 VAC Single Phase (1 Φ 2W + G) | | |
| Output Voltage Regulation | ± 1% | | |
| Output T.H.D | ≤2% THD (Linear Load), ≤6% THD(Non-Linear Load) | | |
| Efficiency – Normal Mode | 88% | | |
| Efficiency – Battery Mode | 88% | | |
| Crest Factor | 3:1 | | |
| Start on Battery | Yes | | |
| Overload Capability (Normal Mode) | Sustaining 10 min @ 105% ~ 130% load; 1sec @ > 130% load | | |
| Overload Capability (Battery Mode) | Shut down UPS after 10 sec @ > 150% load | | |
| Output Frequency | 50/60 Hz ± 0.05 Hz (Battery Mode) | | |
| **Battery** | | | |
| Battery Type | Sealed Lead-Acid maintenance-free 12VDC/7Ah per cell | | |
| Number of Batteries | 40 cells | 40 cells | 40 cells |
| Typical Backup Time at Full Load | 12 mins | 8 mins | 6 mins |
| Recharge Time to 90% | < 8 hours | | |
| Charger Current (Max) | 4.2A * | | |
| **Advanced Diagnostics** | | | |
| Front Panel Indication – LCD | UPS Status, I/P Voltage & Frequency, O/P Voltage & Frequency, Battery Voltage, Battery Capacity, Loading %, Temperature, History Alarm. | | |
| Front Panel Indication – LED | Normal (Green), Warning (Yellow), Fault (Red) | | |
| Audible Alarms | Battery Mode, Low Battery, Overload, Fault | | |
| **Communication Interface** | | | |
| Communication Port | RS232 (Standard), DB9 or USB or AS400 or SNMP / HTTP (Optional) | | |
| **Environmental** | | | |
| Audible Noise | < 55dBA @ 1 meter | | |
| **Mechanical** | | | |
| UPS Dimensions (W x H x D mm) | 260 x 717 x 570 | | |
| Battery Cabinet Dimensions (W x H x D mm) | 260 x 717 x 570 | | |
| UPS Weight (kgs) | 39 | 55 | 55 |
| Battery Cabinet (w/battery) (kgs) | 143 | 143 | 143 |
| Total Weight (kgs) | 182 | 198 | 198 |

* All T4 models can have up to 25A charging capabilities when connected in parallel with the ST-CHARGER external super charger.

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# UPS - ONLINE (TRANSFORMERLESS)
## 3 PHASE INPUT, 1 PHASE OUTPUT

## T4T SERIES (10kVA-50kVA)

The T4T Series UPS is an online sine wave UPS mainly designed for major equipment used in large-scaled data centers (such as measurement equipment, industrial automation equipment, etc.) with high performance. Its high reliability provides necessary protection on load for the users in finance, communication, traffic, tax, forces, security, power source, education, government and enterprise etc. The T4T Series UPS is true double conversion on-line UPS. With IGBT power units, SPWM inverter, intellectual multi modes battery management technique, advanced tech and power management software.

### TRUE ONLINE DOUBLE CONVERSION UPS

Output is fully isolated by a transformer, with IGBT power units used to solve problems on the electric system such as lightning strikes, power blackouts, etc.

### EMC COMPLIANT

All products are EMC compliant. Testing points include conducting disturbance, radiant disturbance, conducting ant-disturbance, radiant ant-disturbance, power fault, mass pules, ESD etc. Excellent EMC features make the T-UK Series capable of high frequency communication and video & audio broadcasting.

### COLD START FUNCTION

Because of special current limiting circuits on the UPS, the user can start the UPS directly on its battery bank without mains being available. The UPS has a more powerful cold starting capability and is able to run on full load.

### PERFECT PROTECTION MEASURES

Protection for over output voltage and current, low battery, quick current limit and short-circuit to avoid stoppages caused by the user's incorrect operation.

### INTELLIGENT BATTERY MANAGEMENT TECHNOLOGY

Equipped with patented intellectual battery management technique. With proffessional management design on battery charging or discharging, the user can get high battery reliability and running life. At the same time the intellectual charging module can select the right charging power according to different battery configurations making sure that there is rapid power compensation on the battery bank.

### FLEXIBLE NETWORK SUPERVISION

Flexible network supervising ability to realise intellectual monitoring of the UPS. Including close point-to-point communication supervising, middle range communication supervising, and remote network management. Based on these, there are many UPS functions such as real time supervising over running status and features, automatic call, sending e-mail, cell phone text messaging, voice function, remote on/off for the UPS etc.

### CURRENT EQUALISATION CONTROL TECHNIQUE

Current equalisation control technique, for N units parallel redundancy or N+1 redundant parallel connection, digitized current equalisation control, reliability and redundancy of the system is higher than traditional parallel systems and field installation and debugging is simple. UPS unit can be switched on or be on line on standby mode, to enable hot maintenance on line of parallel system.

DUXBURY UPS

# UPS - ONLINE (TRANSFORMER)
## 3 PHASE INPUT, 1 PHASE OUTPUT

| Model | ST4100T | ST4150T | ST4200T | ST4300T | ST4400T | ST4500T |
|---|---|---|---|---|---|---|
| **Input** | | | | | | |
| Voltage Range | 400VAC (-25%~+25%) | | | | | |
| Frequency Range | 50Hz / 60Hz ± 5% | | | | | |
| Phase | Three phases, five wires | | | | | |
| Battery Voltage | 16 x 12Vdc = 192Vdc | | 29 × 12Vdc = 348Vdc | | | |
| **Output** | | | | | | |
| Rated Power - kVA/kW | 10/7 | 15/10.5 | 20/16 | 30/24 | 40/32 | 50/40 |
| Voltage Range | 230VAC ± 2% | | | | | |
| Frequency | 50Hz ± 1%(battery mode) | | | | | |
| Waveform | THD ≤ 3%(linear load) | | | | | |
| Battery Efficiency | ≥ 90% (100% linear load) | | | | | |
| Overload Capacity | 10min at 105%, 1min at 125%, 0.5s at 150% | | | | | |
| Crest Factor | 3:1 | | | | | |
| Parallel Equal Current | ≤ 5%(only applicable to the parallel models) | | | | | |
| **Other** | | | | | | |
| Parallel Function | Random extending or N+1 redundancy parallel connection (only applicable to the parallel models) | | | | | |
| LCD Display | Input voltage, Output voltage, Load capacity, Battery voltage | | Input voltage, Frequency, Output voltage, Battery voltage, Load, DC current etc. | | | |
| LED Display | Operation status | | | | | |
| Alarm Function | Mains supply abnormal, Low battery, Overload | | Overload, AC input abnormal, Low battery, Failure, Over-temperature | | | |
| Communication Function | RS232/RS485, dry connection communication signal | | | | | |
| Protection Function | Low battery, Overload, Overheat, Output short circuit, Output over voltage | | | | | |
| Audible Noise | < 60dBA @ 1m | | | | | |
| Working Temperature, Relative Humidity | 00C-400C, 0-95% (no condensation) | | | | | |
| Dimension (W x D x H) (mm) | 740 x 300 x 100 | 800 x 400 x 1180 | | | | |
| Weight (kg) | 135 | 160 | 205 | 225 | 280 | 305 |

10-15kVA models can have up to 15A charging capabilities when connected in parallel with the ST-CHARGER external super charger.

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# UPS - ONLINE (TRANSFORMER)
3 PHASE INPUT, 3 PHASE OUTPUT

## T5 SERIES (10kVA-400kVA)

ST5 (10kVA-400kVA) features true on line double conversion and zero sec. transfer time. Intellectual blocking design, adopts advanced power apparatus IGBT, predominantly a SPWM inverter. It also features MMBM intellectual multi-modes battery management and intellectual monitoring and management software. The parallel capacity can extend the on line parallel redundancy or N+1 for upgradeability.

### TRUE ONLINE DOUBLE CONVERSION

Output is isolated by a transformer, with IGBT power units used, making sure a safe working environment for all equipment. Isolation between N and G, and anti-impact from all kinds of surgres and disturbances in power.

3 output phases can be adjusted independently, thus allowing 3 phase 100% unbalanced load, flexible load capacity and high system reliability. Especially fit for computer rooms, communication etc.

### RELIABLE EMC FEATURES

All products have passed the EMC tests. Testing includes conducting disturbance, radiant disturbance, conducting anti-disturbance, radiant anti-disturbance, power fault, mass pulse, surge, ESD etc. Excellent EMC features allow the ST5 series to be capable of high frequency communication and video & audio broadcasting.

### COLD START FUNCTION

Due to a special current limiting circuit on the UPS, the user can start the UPS directly from the battery bank connected for emergency stituations in a no mains situation. The UPS can run on cold start on full load.

### FULL FUNCTION LCD DISPLAY

All ST5 series products above 20KVA are equipped with large LCD Displays. They also feature real time surveillance on UPS running parameters and status, FE and daily maintenance.

The ST5 features an Intelligent battery management system while batteries are being charged and discharged for longer operational life and higher reliability of the batteries.

### FLEXIBLE NET PROJECT MONITORING (OPTIONAL)

Independent digital remote control, supported by RS485, with a range of 1000 meters or SNMP network adapter

### ADVANCED NON-MASTER-SLAVE SELF-ADAPTIVE CONTROL TECHNOLOGY (PARALLEL TYPE)

ST5 series parallel UPS features a powerful parallel capacity. There is no need to set the parallel units. The User can extend the parallel capacity as needed for N+1 parallel redundancy. This increases the reliability of the power system.

DUXBURY UPS

# UPS - ONLINE (TRANSFORMER)
## 3 PHASE INPUT, 3 PHASE OUTPUT

| Model | ST5 010 | ST5 020 | ST5 030 | ST5 040 | ST5 050 | ST5 060 | ST5 080 | ST5 100 | ST5 120 | ST5 160 | ST5 200 | ST5 300 | ST5 400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Input** | | | | | | | | | | | | | |
| Voltage * | 380/400VAC ± 25% | | | | | | | | | | | | |
| Rectifier Frequency Range | 40Hz~65Hz | | | | | | | | | | | | |
| SYNC Frequency Tracking Range | 50Hz ± 5% (± 10% option) | | | | | | | | | | | | |
| Phase | 3φ4W+PE | | | | | | | | | | | | |
| Battery | 12Vdc × 29 = 348Vdc / 12vDC x 30 = 360Vdc | | | | | | | | | | | | |
| Charge Current (Max) | 5~40A (adjustable) | | | | | | | | | | 5~80A (adjustable) | | |
| Charge DC Voltage Regulation | 395V ± 5Vdc | | | | | | | | | | | | |
| DC Ripple Voltage | <1% | | | | | | | | | | | | |
| **Output** | | | | | | | | | | | | | |
| Capacity (kVA) | 10 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 120 | 160 | 200 | 300 | 400 |
| Power Factor | 0.8 | | | | | | | | | | | | |
| Phase | 3φ4W+PE | | | | | | | | | | | | |
| Voltage * | L-N: 220VAC ±1%, L-L: 380VAC ± 1% | | | | | | | | | | | | |
| Frequency | Utility normal, follow in phase automatically, Utility fault, output frequency at 50Hz ± 0.2% | | | | | | | | | | | | |
| Parallel mode (optional) | None-principle-subordinate Adaptive Control Technique, User can extend parallel capacity as needed for N+1 parallel redundancy | | | | | | | | | | | | |
| 3 phase 100% load unbalance voltage stability | ≤2%, allows 100% unbalance | | | | | | | | | | | | |
| Waveform | Sinewave THD ≤ 3% (linear load) | | | | | | | | | | | | |
| Crest Factor | 3:1 | | | | | | | | | | | | |
| Efficiency | 90% | | | | | | | | | | | | |
| Static Bypass Transfer Time | 0ms | | | | | | | | | | | | |
| Overload Capacity | 110% load for 30 min,125% load for 10 min,150% load for 1min | | | | | | | | | | | | |
| Regulation no load to full load steady state | ±2% | | | | | | | | | | | | |
| **Other** | | | | | | | | | | | | | |
| Panel Display | LCD Display indicates 3 phase input voltage, input frequency, 3 phase output voltage, load, battery voltage, battery charging and discharging etc. LED indicates running status | | | | | | | | | | | | |
| Battery Self-Testing | Automatically sounds an alarm and estimates battery status in battery abnormal status | | | | | | | | | | | | |
| Lightning Protection | Complies with IEC 1312 | | | | | | | | | | | | |
| Operating Temp., Humidity | 00C-400C, 95% (non-condensing) | | | | | | | | | | | | |
| Dimension (W x D x H) (mm) | 500 x 800 x 1180 | | | 800 x 800 x 1600 | | | 1000 x 800 x 1800 | | | | 1800 x 1000 x 2000 | 2200 x 1000 x 2000 | |
| Weight (kg) | 185 | 205 | 235 | 430 | 450 | 470 | 680 | 705 | 745 | 805 | 1400 | 2350 | 2380 |

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# UPS - ONLINE (TRANSFORMER)
## 3 PHASE INPUT, 3 PHASE OUTPUT

## T6 SERIES 10kVA-1MVA

The AEC Star T6 series UPS is an on-lne double conversion three phase UPS with a fully digitised intelligent galvanic isolation design. Single unit ratings of up to 1MVA are available and parallel capability is also available. The UPS can also be cusomised for various input voltages allowing them to be used in various applications (e.g. mining).

### FEATURES AND ADVANTAGES:

#### Advanced Technology DSP, IGBT and Switching Components

To increase reliability and efficiency.

#### True Galvanic Isolation Design

An isolation transformer is used on the output. This can solve numerous problems such as poor input grounding, different grounds between input and output and ground leakage currents. The user also has the benefit of attenuation of common mode noise from the output isolation transformer.

#### Multi-CPU design and Software/Hardware Cooperate Control

Several CPU's are employed in the control circuitry, critical functions are designed to employ parallel redundancy to improve reliability.

#### Redundant Power Supply

An extra power supply is connected redundantly to supply power to the static switch, so that, there will be AC ouput no matter what happens to the UPS.

#### Plug and Play Modular Design

The power circuit is seperated into several modules plugged into slots in the UPS, which is easy to remove, allowing for quick maintenance and easier trouble-shooting.

#### Each Phase with Individual Inverter Support

Allowing for 100% unblanced load.

#### Protection Against Detached or Floating Neutral of the Input

MOV's are used at the input and provide sufficient protection to both the UPS and the load from any lightning or surges casued by neighbouring large loads.

#### Large Charging Power (Selectable)

The charge power is selectable according to the Ah of the battery bank. Ah ratings to allow for 8 hours backup time can be supported with no additional external chargers needed.

#### Various Interface Options

Remote control panel, 3 phase software for PC monitoring, auto dialling module, battery monitoring module, 3 Phase SNMP card, emergency stop switch.

#### 12-Pulse Fully Controlled Rectifier (Optional)

In order to further improve the power factor and reduce harmonic current drawn by the rectifier, the UPS from 120kVA uses a 12-pulse fully controlled rectifier. The total harmonic current can be reduced to around 10% and the power factor improved to over 0.8. A phase shift transformer is added to achieve the performance. The input inductor is retained to obtain the best result. This is a more rugged topology.

#### Parallel Operation (Optional)

To increase the capacity and reliability of the UPS.
The load is equally shared between the paralleled units.
When there is a fault with one of the units, the other units continue running without output interruption.

#### FEATURES:

- Wide input range, robust design for harsh environments
- DC start function, can be started without AC
- Intelligent, safe and unique battery management system
- Variety of accessories
- Parallel operation available
- Specifications can be customised
- Frequency converter option available.

DUXBURY UPS

# UPS - ONLINE (TRANSFORMER)
## 3 PHASE INPUT, 3 PHASE OUTPUT

| Model | ST6 010 | ST6 015 | ST6 020 | ST6 030 | ST6 040 | ST6 050 | ST6 060 | ST6 080 | ST6 100 | ST6 120 | ST6 160 | ST6 240 | ST6 320 | ST6 400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| kVA | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 120 | 160 | 240 | 320 | 400 |
| **Input (Rectifier)** | | | | | | | | | | | | | | |
| Input Voltage | 190V / 208V / 380V / 400V / 415V / 440V / 480V / 600V, 3P4W or 3P3W | | | | | | | | | | | | | |
| Input Range | ± 20% (> 20% available on request) | | | | | | | | | | | | | |
| Input Frequency | 50Hz / 60Hz ± 5Hz | | | | | | | | | | | | | |
| Power Walk In | 0% - 100% : 20sec | | | | | | | | | | | | | |
| **Battery** | | | | | | | | | | | | | | |
| DC Voltage | 29 x 12Vdc = 348Vdc | | | | | | | | | | | | | |
| Maximum Charge Current | 5 | 8 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 80 | 120 | 160 | 200 |
| **Inverter** | | | | | | | | | | | | | | |
| Output Voltage Regulation | 190V / 208V / 380V / 400V / 415V / 440V / 480V / 600V, 3P4W or 3P3W ± 1% | | | | | | | | | | | | | |
| Output Power Factor | 0.8 | | | | | | | | | | | | | |
| Output Frequency | 50Hz / 60Hz ± 3Hz (lock range), 50Hz / 60Hz ± 0.1Hz (free running) | | | | | | | | | | | | | |
| Phase Shift | < 0.50 at 100% unbalanced load | | | | | | | | | | | | | |
| THD (Linear Load) | < 2% | | | | | | | | | | | | | |
| Overload | < 110% Continuous, 110%-125% 15mins, 125%-150% 10mins, > 150% 30sec | | | | | | | | | | | | | |
| Efficiency at 100% Load | 93% | | | | 93.5% | | 94% | 94.5% | | 95% | | | | |
| **Overall Characteristics** | | | | | | | | | | | | | | |
| Overall Efficiency | 91 | | | | 91.5 | 92 | | 92.5 | | 93 | | | | |
| Maximum Heat Dissipation (kW) | 1.1 | | 1.3 | 1.9 | 2.6 | 3 | 3.5 | 4.6 | 5.4 | 6.5 | 8.7 | 13 | 17.4 | 21.7 |
| Dimensions (L x W x H) (mm) | 550 x 800 x 1600 | | | | | | | 1100 x 800 x 1600 | | | | 2200 x 800 x 1600 | | 3300 x 800 x 1600 |
| Weight (kg) | 270 | 300 | 350 | 400 | 480 | 550 | 680 | 820 | 950 | 1180 | 1450 | 1950 | 2450 | 3100 |
| Audible Noise | < 65dBA (at 1m) | | | | | | | < 67dBA (at 1m) | | | | | | |
| Temperature / Humidity | 00C-400C, 320F-1040F / 0-90% (Non-condensing) | | | | | | | | | | | | | |
| Altitude | < 1500m above sea level | | | | | | | | | | | | | |
| 12 Pulse Rectifier | Optional | | | | | | | | | Standard | | | | |
| FCC Class A, EN50091-1, -2 | Yes | | | | | | | | | | | | | |
| Short Circuit Protection | Rectifier, Reserve and Bypass | | | | | | | | | | | | | |
| Lightning / EMC Filter | MOV / Input & Output | | | | | | | | | | | | | |
| Galvanic Isolation | Output true Galvanic Isoation (input available on request) | | | | | | | | | | | | | |
| Indicator & Alarm | LCD, LED, Mimic Display, Buzzer | | | | | | | | | | | | | |
| Remote Control / Communication Interface | Monitoring 1-99 UPS simultaneously / Dry Contact, RS232, RS485 | | | | | | | | | | | | | |

Bigger sizes up to 1000kVA available

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DUXBURY UPS

# UPS - ONLINE (TRANSFORMER)
## 3 PHASE INPUT, 3 PHASE OUTPUT

## T2000 SERIES (20kVA-600kVA)

With many thousands of units sold, the PHD T2000 series UPS is now legendary. Chosen by major enterprises around the world for its reliability and performance, words simply can't explain its phenomenal success. But we don't rest on our laurels, the T2000 has been modified and updated and now offers even greater performance. With a Mean Time Before Failure of power to the load in excess of 20 years the T2000 is even better value for money. And with power ratings from 50kVA to 600kVA and higher, the T2000 is engineered to offer power protection sufficient to support a whole building if required. And as your power requirements grow, more T2000 units can be added, offering superb flexibility.

### EXPANDABLE TO PROTECT

For genuinely redundant power protection, UPS can be installed in either active parallel or hot standby mode, ready to take over the load automatically in the event of a critical component failure. The T2000 can be configured to function in either active parallel or hot standby mode, with up to 6 units in the array.
In active parallel mode, the load is balanced across all the configured units, ensuring that no single member of the array is overstressed. If a unit needs to be shutdown for maintenance or repair, the remaining units in the array will rebalance the load and continue to provide uninterrupted protection. It is even possible to remove a unit from the array during an outage without affecting the load while the remaining units retain sufficient battery runtime.
In hot-standby mode, one or more units support the load, while the remaining members of the array functions as standby unit. The standby unit is continually on-line, but only takes over the load when one of the primary units is no longer active.
This means that there is no break when power is transferred, and the load continues to be supported without disturbance.

### MANUAL AND STATIC BYPASS TO PROTECT

A manual by-pass switch allows power to be transferred directly to the mains without disturbance to the load. The UPS can then be safely powered down for maintenance or repair, on completion of the work the UPS can be powered up and the load once again transferred back to the UPS with no interruption in service. If the power demand of your equipment exceeds the overload level of the UPS the static switch defaults to the mains ensuring continuous power in the event of system abuse or short term overload conditions.

### TIME TO PROTECT

In addition to providing sufficient run-time to save files and shutdown operating systems, autonomies of up to 8 hours are available allowing you the option to complete a day's work without disturbance to your equipment, even during a power cut!

### UPS MANAGEMENT SOFTWARE

The UPS management software is installed on a server or workstation connected to each UPS via the serial port. Power failure, power restored, battery failure or eight events will be detected and the user informed. A shutdown will be initiated when the batteries are exhausted or a technical problem occurswith the UPS. The UPS management software disconnects network connections, logs out users and closes open applications (subject to app/os support) before shutting down the operating system itself.

### SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)

The T2000 SNMP external agent can be located up to 5 metres away from the UPS. Initial configuration is carried out by serial comms using any suitable terminal application (e.g. Hyperterminal for Windows). The embedded HTTP server presents an HTML interface to the network, which can be accessed from any web browser. All system parameters can be configured from here, including scheduled shutdown. A sophisticated Java applet provides full monitoring in real time, along with comprehensive event and history logs.

# UPS - ONLINE (TRANSFORMER)
## 3 PHASE INPUT, 3 PHASE OUTPUT

| Model* | ST2000-3360 | ST2000-3380 | ST2000-33100 | ST2000-33120 | ST2000-33150 | ST2000-33200 |
|---|---|---|---|---|---|---|
| **Input Rectifier** | | | | | | |
| Nominal Capacity - kVA | 60 | 80 | 100 | 120 | 150 | 200 |
| Input Nominal Voltage | 200/208 V 3P or 380/400/415 V 3P + N or 440/465/480 V 3P | | | | | |
| Nominal Frequency | 50 / 60 Hz (Can be used as frequency converter) | | | | | |
| Frequency Range | + - 5% | | | | | |
| P.F. @ 400V at Nominal | 0,83 or 0,93 with Input Filter/PFC | | | | | |
| Soft Start time | 20-30 seconds | | | | | |
| Battery | 12Vdc x 32 = 384Vdc | | | | | |
| Charge Current (Max) | 20A | 30A | 40A | | | 60A |
| **Inverter Input** | | | | | | |
| Nominal Voltage | 192 V for 200/208 V – 384 V for 380/480 V | | | | | |
| **Inverter Output** | | | | | | |
| Nominal Voltage | 200/208 V 3P or 380/400/415 V 3P + N or 440/465/480 V 3P | | | | | |
| Current at p.f 0.8 | 86.71 | 115.6 | 144 | 174 | 221 | 287 |
| Nominal Frequency | 50/60 Hz | | | | | |
| THD Linear load | =<1,5% | | | | | |
| THD at Non Linear load with Crest Factor 3:1 | =<5% | | | | | |
| Static Voltage Regulation | + - 1% | | | | | |
| Dynamic Voltage Regulation 0-100% | + - 5% | | | | | |
| **Output Frequency Regulation** | | | | | | |
| With Mains Synchronisation (%) | +/- 1; 1,5 ;2,4 | | | | | |
| With Internal Micro | + - 0,001% | | | | | |
| Load Crest (Ipk/Irms) | Better than 3 : 1 | | | | | |
| Overload | 110% for 60 min -- 125% for 10 min -- 150% for 1 min | | | | | |
| Efficiency AC-AC @ 100% | 93.4 | | | 93.5 | 94.1 | 95.1 |
| **Mechanical Data** | | | | | | |
| Dimensions (W x H x D) (mm) | 800 x 750 x 1200 | | | 1400 x 750 x 1200 | | |
| Weight (kg) | 580 | 630 | 670 | 700 | 900 | 1100 |

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# UPS - ONLINE (TRANSFORMERLESS)
3 PHASE INPUT, 3 PHASE OUTPUT

## MP MODULAR SERIES - 10-300KVA

FEATURES:

- Hot swappable for each module, easy maintenance
- Redundant and High Reliability
- Strong load adaptability for linear and nonlinear load
- Intelligent module and system protection design
- Double DSP controller for individual power module
- IGBT modules rather than discrete components are applied in the power module.
- Friendly generator interface
- SNMP communication card
- Battery temperature compensation module
- Alarm and message module for mobile phone.

# UPS - ONLINE (TRANSFORMERLESS)
## 1 PHASE INPUT, 1 PHASE OUTPUT

| Specifications<br>Capacity | 10-200KVA | 300KVA |
|---|---|---|
| **Main Input** | | |
| Input voltage | 380V/400V/415V, -40%~+25% | 380V/400V/415V,-20%~+25% |
| Input frequency | 50/60Hz, 40-70HZ | 50/60Hz, 40-70HZ |
| Power factor | >0.99 | >0.99 |
| **Battery** | | |
| Battery voltage | ±240VDC | ±240VDC |
| Charger power | 20%*Power | 20%*Power |
| Charger voltage precision | 1% | 1% |
| **Bypass** | | |
| Bypass voltage | 380V/400V/415V, three phase | 380V/400V/415V, three phase |
| Bypass voltage window | -20%-+15%, full load | -20%-+15%, full load, settable |
| Bypass overload capabiltiy | 125%< load <130%, last for more than 1 hour | < 115%, long time operation |
| | 130%<load<150%,last for more than 6 minutes | 115%< load <120%, last for more than 1 hour |
| | >1000%, last for more than 100ms | 120%<load<125%,last for more than 10 minutes |
| **Output** | | |
| Output voltage | 380V/400V/415V, three phase | 380V/400V/415V, three phase |
| Voltage precision | 1% (balance load),1.5% (unbalance load) | 0.5% (balance load),±1% (unbalance load) |
| Voltage THD | THD<1.5%(linear load),THD<5%(nonlinear load) | THD<1%(linear load),THD<5%(nonlinear load) |
| Power factor | 0.8 | 0.8 |
| Phase tolerance | 120°±0.5° (balance and unalance load) | 120°±0.5° (balance and unalance load) |
| Crest factor | 3:1 | 3:1 |
| Overload capabiltiy | 105%,long time operation | 110%, transfer to bypass after 10 minutes |
| | 110%, transfer to bypass after 1hour | |
| | 125%, transfer to bypass after 10 minutes | 125%, transfer to bypass 150%, transfer to bypass after 1 minute after 1 minute |
| | 150%, transfer to bypass after 1 minute | |
| | >150%, transfer to bypass after 200ms | |
| **System** | | |
| System efficiency | Normal mode: 96%, ECO mode: 99%, Bat. Mode: 96% | Normal mode: 96%, ECO mode: 99%, Bat. Mode: 96% |
| Display | LCD+LED, Touch screen and keyboard | LCD+LED, Touch screen and keyboard |
| Interface<br>(Communication Ports ) | RS232,RS485,Dry contacts,SNMP card,EPO,Generator interface | RS232,RS485,Dry contacts,SNMP card,EPO,Generator interface |
| Operation temperature | 0-40$^0$C | 0-40$^0$C |
| Storage temperature | -25$^0$C ~70$^0$C | -25$^0$C ~70$^0$C |
| Relative humidity | 0-95% (non-condensing) | 0-95% (non-condensing) |
| Noise(dB) | <55dB | <55dB |
| Weight(kg) | 6-module cabinet / 150kg | 10-module cabinet / 180kg |
| | 10-module cabinet / 180kg | |
| | 10KVA: 20kg | |
| | 15KVA: 21kg | |
| | 20KVA: 22kg | 30KVA: 22kg |
| Dimension(W x D x H)(mm) | 6-module cabinet / 600 x 900 x 1600 | 10-module cabinet / 600*900*2000 |
| | 10-module cabinet / 600 x 900 x 2000 | |
| | Module / 440*600*134 (10KVA/15KVA/20KVA) | Module / 400 x 600 x 133 (30KVA) |

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## IG SERIES - INVERTER/CHARGER (600VA-2kVA)

- Simulated sinewave inverter
- Selectable input voltage range for home appliances and personal computers
- Auto restart with AC recovery
- Overload, and short circuit protection
- Cold start function
- Generator and Computer-related products compatible
- Reverse polarity protection.

| Model | IG600 | IG1000 | IG2000 |
|---|---|---|---|
| Capacity | 600VA/300W | 850VA/600W | 2000VA/1200W |
| **Input** | | | |
| Voltage | 220/230/240VAC | | |
| Selectable Voltage Range | 140-300VAC | 90-280VAC (wide range), 170-280VAC (narrow range) | |
| Frequency Range | 50Hz/60Hz (auto-sensing) | | |
| **Output** | | | |
| AC Voltage Regulation (Batt. Mode) | ±10% (battery mode) | | |
| Frequency Range (Batt. Mode) | 50Hz/60Hz ±1Hz | | |
| Transfer Time | 10ms Typical | | |
| **Battery** | | | |
| Battery Voltage | 12Vdc | | 24Vdc |
| Floating Charge Voltage | 13.7Vdc ±2% | | 26.8Vdc ±2% |
| Low Battery Alarm Voltage | 10.2Vdc ±2% | | 21.6Vdc ±2% |
| Shutdown Voltage | 9.9Vdc ±2% | | 20.0Vdc ±2% |
| Overcharge Protection | 15Vdc ±2% | | 30Vdc ±2% |
| Maximum Charge Current | 13A | 10A or 20A optional | |
| **Alarm** | | | |
| Low Battery | Sounding every second | | |
| Overload | Sounding evry 0.5 seconds | | |
| Fault | Continuously sounding | | |
| **Physical** | | | |
| Dimensions, L x W x H (mm) | 358.5 x 96.8 x 146.5 | 232 x 293 x 82.5 | |
| Net Weight (kg) | 5.8 | 2.35 | 2.55 |
| **Operating Environment** | | | |
| Humidity | 0-90% Relative Humidity (Non-Condensing) | | |
| Operating Temperature | 00C-500C | | |
| Storage Temperature | -15$^0$C-70$^0$C | | |

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## SKX-M SERIES - MODIFIED SINEWAVE INVERTER (150W-3kW)

- Modified sinewave output
- With or Without Battery Charger
- High Surge Rating
- Hot Swappable Fuse
- Reverse Polarity Protection (Fuse).

| Model | SKX-150-M-XX | SKX-300-M-XX | SKX-500-M-XX | SKX-600-M-XX | SKX-1000-M-XX | SKX-1500-M-XX | SKX-2000-M-XX | SKX-2500-M-XX | SKX-3000-M-XX |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (Watts) | 150 | 300 | 500 | 600 | 1000 | 1500 | 2000 | 2500 | 3000 |
| Output Waveform | Modified Sinewave | | | | | | | | |
| Continuous Power (Watts) | 150 | 300 | 500 | 600 | 1000 | 1500 | 2000 | 2500 | 3000 |
| Surge Power (Watts) | 300 | 600 | 1000 | 1200 | 2000 | 3000 | 4000 | 5000 | 6000 |
| DC Input Voltage | 10-15Vdc (12V Version) / 20-30Vdc (24V Version) / 40-60Vdc (48V Version) | | | | | | | | |
| AC Output Voltage | 220-240VAC ± 10% | | | | | | | | |
| Output Frequency | 50/60Hz ± 1Hz | | | | | | | | |
| Efficiency | > 85% | | | | | | | | |
| No Load Current Draw | < 0.25A | < 0.3A | | | < 0.8A | | < 0.9A | | < 0.95A |
| **Protection** | | | | | | | | | |
| Low Voltage Alarm | 10Vdc ± 0.2V / 20Vdc ±0.3V / 40Vdc ± 0.4V | | | | | | | | |
| Low Voltage Shutdown | 9.5Vdc ± 0.2V / 19Vdc ± 0.3V / 38Vdc ± 0.4V | | | | | | | | |
| Over Voltage Shutdown | 15.5V / 30.5V / 61.2V | | | | | | | | |
| Overload | Shut Off Output | | | | | | | | |
| Over Temperature | Shut Off Output | | | | | | | | |
| **Environment** | | | | | | | | | |
| Operating Temperature | -100C - 500C | | | | | | | | |
| Operating Relative Humidity | 20% - 90% RH non-condensing | | | | | | | | |
| Storage Temperature | -300C - 700C | | | | | | | | |
| Automatic Cooling Fan | Turns on above 450C | | | | | | | | |
| Dimensions (mm) | 140 x 105 x 55 | 150 x 105 x 55 | 180 x 105 x 55 | | 210 x 150 x 70 | 310 x 150 x 70 | | 340 x 150 x 152 | |
| Net Weight (kg) | 0.5 | 0.6 | 0.8 | 0.8 | 1.7 | 2.4 | 2.6 | 5.9 | 6.1 |
| **Battery Charger Specs - Model** | SKX-150-MC-XX | SKX-300-MC-XX | SKX-500-MC-XX | SKX-600-MC-XX | SKX-1000-MC-XX | SKX-1500-MC-XX | SKX-2000-MC-XX | SKX-2500-MC-XX | SKX-3000-MC-XX |
| Charging Current | 3A | 5A | 10A | 10A | 10A | 15A | 20A | 20A | 30A |
| Automatic Transfer Time | < 40ms | | | | | | | | |

XX Denotes the DC Voltage - 12Vdc, 24Vdc and 48Vdc available

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## SOLAR INVERTERS- PURE SINEWAVE (150W-3kW)

- True sinewave output
- Power ON-OFF remote control
- Advanced microprocessor
- Input polarity / under voltage / over voltage protection
- Output short circuit / overload / over temperature protection
- Capable of driving highly reactive and capacitive loads
- Three color LED indicators.

| Model* | S150-X | S300-X | S600-X | SK1000-X | SK1500-X | SK2000-X | SK3000-X |
|---|---|---|---|---|---|---|---|
| Rated Power/Surge Power | 150W/200W | 300W/400W | 600W/800W | 1kW/2kW | 1.5kW/3kW | 2kW/4kW | 3kW/6kW |
| **Output** | | | | | | | |
| AC Voltage | 220/230/240VAC | | | | | | |
| Waveform | True Sinewave (THD < 6%) | | True Sinewave (THD < 3%) | | | | |
| Frequency | 50Hz / 60Hz | | 50Hz / 60Hz selectable by DIP switch | | | | |
| AC Regulation | ± 5% | | ± 3% | | | | |
| Power Factor Allowed | cos□(-900) - cos□(+900) | | | | | | |
| LED Indicator | Input voltage level, output load level and fault status | | | | | | |
| **Input** | | | | | | | |
| DC Voltage | 12/24 | | 12/24/48 | | | | |
| No Load Current Draw | 0.22/0.16 | 0.26/0.28 | 0.83/0.43/0.22 | 1.2/0.6/0.28 | 1.4/0.7/0.4 | 2.64/1.32/0.65 | 2.8/1.5/0.7 |
| Voltage Ramge | 10.5-15/21-30 | | 10.5-15/21-30/42-60 | | | | |
| Efficiency (typ. %) | 87/88 | 89/89 | 90/93/94 | 91/93/94 | 90/93/94 | 91/94/95 | 90/93/94 |
| **Protection** | | | | | | | |
| Bat. Low Alarm | N/A | | 11V / 22V / 44V | | | | |
| Bat. Low Shutdown | 10 ± 0.5V / 20 ± 1V | | 10.5V / 21V / 42V | | | | |
| Overload | Shut off output voltage, re-power on to recover | | | | | | |
| Over Voltage | 15V-16V / 30V-32V | | 15.3V / 30.6V / 61.2V | | | | |
| Over Temperature | Shut off output voltage, recovers automatically after temperature goes down | | | | | | |
| Output Short | Shut off output voltage, re-power on to recover | | | | | | |
| Bat. Polarity Reverse | Fuses will become open | | | | | | |
| **Environment** | | | | | | | |
| Working Temp. | 0-400C | | | | | | |
| Working Humidity | 20% - 90% RH non-condensing | | | | | | |
| Storage Temp. & Humidity | -300C-700C / -220F-1580F / 10%-95% | | | | | | |
| **Safety & EMC** | | | | | | | |
| Isolation Resistance | I/P - O/P: 100M Ohms / 500VDC | | | | | | |
| EMI Conduction and Radiation | Compliance EN55022 class B | | Compliance EN55022 class A | | | | |
| EMS Immunity | Compliance EN61000-3 -2, 3 | | | | | | |
| LVD | Compliance EN60950-1 | | | | | | |
| e-Mark | Compliance to e-13 * 72/245/EEC, 95/54/EC | | | | | | |
| **Other** | | | | | | | |
| Dimensions, L x W x H (mm) | 200 x 132 x 72 | 237 x 155 x 72 | 295 x 180 x 72 | 383 x 182 x 88 | 415 x 191 x 88 | 422 x 208 x 166 | 452 x 208 x 166 |

* X denotes the DC Voltage

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## SKX-S SERIES - PURE SINEWAVE INVERTER (300W-5kW)

- Pure sinewave output
- With or Without Battery Charger
- High Surge Rating
- Hot Swappable Fuse
- Reverse Polarity Protection (Fuse)
- Remote Control Option: Control at a distance.

| Model | SKX-300-S-XX | SKX-500-S-XX | SKX-600-S-XX | SKX-1000-S-XX | SKX-1500-S-XX | SKX-2000-S-XX | SKX-2500-S-XX | SKX-3000-S-XX | SKX-5000-S-XX |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (Watts) | 300 | 500 | 600 | 1000 | 1500 | 2000 | 2500 | 3000 | 5000 |
| Output Waveform | Pure Sinewave (THD < 4%) | | | | | | | | |
| Continuous Power (Watts) | 300 | 500 | 600 | 1000 | 1500 | 2000 | 2500 | 3000 | 5000 |
| Max Constant Power Start (Watts) | 360 | 600 | 720 | 1200 | 1800 | 2400 | 3000 | 3600 | 6000 |
| Surge Power (Watts) | 600 | 1000 | 1200 | 2000 | 3000 | 4000 | 5000 | 6000 | 10000 |
| DC Input Voltage | 10-15Vdc (12V Version) / 20-30Vdc (24V Version) / 40-60Vdc (48V Version) | | | | | | | | |
| AC Output Voltage | 220-240VAC ± 10% | | | | | | | | |
| Output Frequency | 50/60Hz ± 1Hz | | | | | | | | |
| Efficiency | > 90% | | | | | | | | |
| No Load Current Draw | < 0.6A | | < 0.8A | | | < 0.9A | | < 0.95A | < 1.5A |
| **Protection** | | | | | | | | | |
| Low Voltage Alarm | 10Vdc ± 0.2V / 20Vdc ±0.3V / 40Vdc ± 0.4V | | | | | | | | |
| Low Voltage Shutdown | 9.5Vdc ± 0.2V / 19Vdc ± 0.3V / 38Vdc ± 0.4V | | | | | | | | |
| Over Voltage Shutdown | 15.5V / 30.5V / 61.2V | | | | | | | | |
| Overload | Shut Off Output | | | | | | | | |
| Over Temperature | Shut Off Output | | | | | | | | |
| **Environment** | | | | | | | | | |
| Operating Temperature | -100C - 500C | | | | | | | | |
| Operating Relative Humidity | 20% - 90% RH non-condensing | | | | | | | | |
| Storage Temperature | -300C - 700C | | | | | | | | |
| Automatic Cooling Fan | Turns on above 450C | | | | | | | | |
| Dimensions (mm) | 135 x 150 x 53 | 220 x 150 x 70 | | 280 x 150 x 70 | 290 x 220 x 88 | 320 x 220 x 88 | 410 x 150 x 70 | | 480 x 220 x 146 |
| Net Weight (kg) | 0.85 | 1.4 | 1.5 | 2.5 | 2.8 | 3 | 5.9 | 6.1 | 14 |
| **Battery Charger Specs - Model** | **SKX-300-SC-XX** | **SKX-500-SC-XX** | **SKX-600-SC-XX** | **SKX-1000-SC-XX** | **SKX-1500-SC-XX** | **SKX-2000-SC-XX** | **SKX-2500-SC-XX** | **SKX-3000-SC-XX** | |
| Charging Current | 5A | 10A | 10A | 10A | 15A | 20A | 20A | 30A | N/A |
| Automatic Transfer Time | < 40ms | | | | | | | | N/A |

XX Denotes the DC Voltage - 12Vdc, 24Vdc and 48Vdc available

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## ES1948 SERIES - SWITCHING MODE RECTIFIER

The PHD ES1948-48V/39.6A is a switched mode rectifier (SMR) module designed to provide up to 39.6A of output current into a 48V nominal system. This rectifier has been designed especially to be used in conjunction with a battery to provide an uninterruptable DC power system. The low noise and high reliability make it ideally suited to telecommunications applications. The rectifiers are designed to slide and plug into a single magazine-SR1948-9, designed for a 19" rack, which can accommodate up to 9 rectifiers and up to 32 rectifiers can be configured as a system using one control and supervisory unit (MCSU2048).

The ES1948 Switching Mode Rectifiers are highly compact, highly efficient, fully featured switch mode rectifiers which can operate in a modular rack environment with overall control from the control and supervisory unit MCSU2048. With overall control, such features as active current sharing, accurate battery voltage regulation, battery recharging current limit control, automatic battery equalization and battery temperature compensation are achieved.

The ES1948 rectifier modules incorporate a microcontroller-based control card which incorporates the control and supervisory facilities of the SMR. The microcontroller enables digital communications to the MCSU2048 as well as to the outside world (via the MCSU2048), so that it is possible to examine the operating parameters and, if necessary change them to suit a particular situation, from a remote location, even a distant one if a modem is used. This method of monitoring and control opens up entirely new methods of routine and emergency maintenance procedures.

### INTERFACE BOARD AND OPTIONAL ACCESSORIES

**MUIB:** PHD's MUIB board combined with MCSU, external transducers and digital or analog I/O contacts to control and monitor a 24V or 48V or 110V DC power system. It provides a basic interface between the MCSU and the system environment.

**MMIB (optional):** PHD's MMIB board is an add-on module for the MCSU. It is used to monitor external AC power sources in either single phase or three phase configurations during operation.

**BCM (optional):** PHD's BCM board is an add-on module for the MCSU. It is used to monitor individual cells of a batteries during either float, equalize operation, or discharge. Each BCM board is capable of monitoring up to 24 cells(BCM) or 96 cells(BCM2).

**SMM (optional):** PHD's SMM board is an expansion of the MCSU. It allows the user to monitor the status of equipment that is external to PHD's DC power system. It can also be used to monitor a 3rd party DC power system. Using the same communication link and winCSU2000 software, the SMM can supervise numerous off-site systems from a central monitoring station.

**WinCSU2000:** PHD's WinCSU2000 software is an intuitive program designed for the Windows 95,98 and NT environments. Working through MCSU and interface boards, you can monitor and control PHD's DC power system either locally or remotely through a modem.

**MCSU NetAgent □:** PHD has integrated various communication protocols over networking to enable the equipment's real-time remote monitoring and management via MCSU NetAgent □. It is equipped with a UTP RJ45 plug for 10Base-T or 100M fast Ethernet connecting through TCP/IP, UDP, HTTP, Telnet, SNTP, PPP or SMTP protocol to LAN and WAN. It also has a RS232 port to connect with an external modem to dial in via the PPP protocol to access an internet connection.

### FEATURES:

- Innovative single phase and three phase input stage with wide input range (90-275VAC, 310-480VAC)
- Power factor > 0.99
- High efficiency
- Microprocessor based
- Active or passive load sharing
- Rear "push in to plug in" connection for AC, DC and communications link
- Weight less than 1.9kg
- Exceptional power density (>18W/in3).

### APPLICATIONS:

- Telephone Exchanges
- Cellular Phone/ Radio Base Stations
- Satellite Base Stations
- Microwave Links Remote Multiplexes
- Rural Telecomunications
- PABX's
- Railway Switching Controls
- Transmission and ISDN
- Equipment
- Power Plants
- Airport, Hospital, Banks.

# SWITCH MODE RECTIFIERS
## 1 PHASE & 3 PHASE

| Model | ES1948 |
|---|---|
| **Input** | |
| Voltage | Wide Input Range: 90-275Vac or 310-480Vac |
| Frequency | 44~66 Hz |
| Input Protection | 13A HRC fuses at input of SMR(line and neutral);<br>power circuit is turned off if the AC voltage exceeds 275Vac or falls to less than 90Vac |
| Current | <12A rms |
| Power Factor | >0.99 at full load; sinusoidal wave shape |
| THD | <5% at full load; satisfies requirements of EN61000-3-2 |
| Efficiency | >91% at nominal mains voltage |
| **Output** | |
| Voltage | Float: -Adjustable 48~59V; Equalise: -Adjustable 50~61V |
| Current Limit | Adjustable 5~40A |
| Power (Max) | 1900W at 48~60Vdc(input>185Vac); 900W at 48~60Vdc(input 90~185Vac) |
| Load Sharing | Better than ±5% of full scale with active current sharing from MCSU2048 |
| Protection | Overvoltage - only faulty unit shuts down<br>Overcurrent - can sustain short circuit at output terminals indefinitely<br>Over-temperature - gradual reduction of current limit if heat-sink temperature exceeds pre-set limit |
| Static Regulation | Line- +0.1%; Load- +1.0% |
| Dynamic Regulation | +3% for 10~90% or 90~10% load variation; +1% for +25% step change in AC input voltage |
| Output Noise | < 2mVrms Psophometric weighting; < 10mVrms 10kHz - 100MHz; < 100mV peak to peak 0~30MHz bandwidth |
| **Other** | |
| Surge Protection | EN 61000-4-5 |
| EMC | Emission: EN 61000-6-3,Immunity: EN61000-6-1 |
| Inrush Current | <12 Arms peak at nominal mains voltage |
| Voltage Withstand Test | 3.0 kVac – input and output (4.25 kVdc primary-secondary); 1.5 kVac – input earth (2.12 kVdc primary-ground); 0.75 kVdc – output earth |
| **Environmental** | |
| Audible Noise @ 1m | < 65dBA |
| Operating Temperature | Operating range -40$^0$C ~ 70$^0$C; derated power at 50$^0$C ~ 70$^0$C |
| Cooling | Two fan cooled, speed controlled and alarmed |
| Humidity | 0~95% non-condensing |
| **Mechanical** | |
| Dimension (W x H x D) | 41mm x 144mm x 287mm |
| Weight | <1.9kgs(4.19lbs) |
| **Alarms** | |
| Alarm & Status LED indication on SMR | On (Green) - SMR functioning normally<br>Alarm (Yellow) - Blinking when any SMR alarm is present.<br>Shutdown (Red) - Stays on when SMR has turned off due to a signal from the MCSU2048 or an internal fault |
| Rectifier Alarms | Low/High output voltage alarm; Over voltage shutdown alarm; Current limit alarm; Fan Alarm; Temperature alarm; Rectifier failure alarm |

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DUXBURY UPS

# BATTERY CHARGER
FOR 192VDC & 240VDC SYTEMS

## EXTERNAL BATTERY SUPER CHARGER

### DESCRIPTION:

The PHD external battery charger is suitable for any 192Vdc and 240Vdc system (16 and 20 batteries in series). It is designed for 192Vdc and 240Vdc UPS systems to enable longer standby times for them. The 240Vdc version can be used with PHD's T3 Series (6-10kVA models) and T4 Series (10-20kVA models) and the 192Vdc version can be used with PHD's T3T Series (5-15kVA) and T4T Series (10-15kVA). It is easy to install as it is connected in parallel to the UPS's existing battery charger.

### FEATURES:

- Compact and light
- Easy to install
- Battery overcharge protection
- Input surge protection.

| Model | ST-CHARGER-10A | ST-CHARGER-12A |
|---|---|---|
| **Input** | | |
| Voltage | (176 -276)VAC @ Full Load | |
| Frequency | (46 - 75)Hz for 50Hz system | |
| Power Factor | ≥0.96@ full load | |
| THD | <20%@ full load | |
| **Output** | | |
| Current | 10A Nom. / 10A Max. | 12A Nom. / 21A Max. |
| Voltage | 160V Minimum, 218V Nominal, 224V Maximum | 200V Minimum, 273V Nominal, 280V Maximum |
| Voltage Ripple | 1%@ full load | |
| Current Ripple | 10% of Ah CAP @ full load | |
| Efficiency | 90% | |
| **Fault Protection** | | |
| Output Reverse Polarity Protection | Fuse will open when reversing | |
| Short-circuit Protection | Yes | |
| Input Protection | 276Vac(+/- 2%) Over Voltage, 176 Vac(+/- 2%) Under Voltage, 110%,1s Open Circuit | |
| **Fault Protection** | | |
| Working and Storage Temperature | 00C - 400C | |
| Humidity | <95% (No condensing) | |
| Altitude | < 1000m | |
| **Fault Protection** | | |
| ESD | IEC 61000-4-2 Level 4 | |
| RS | IEC 61000-4-3 Level 3 | |
| EFT | IEC 61000-4-4 Level 4 | |
| Surge | IEC 61000-4-5 Level 4 | |
| Conduction | IEC/EN 62040-2 Category C3 | |
| Radiation | IEC 61000-3-2 | |
| Safety | IEC 60950-1/EN 60950-1 | |
| Drop, Variation | ISTA Procedure 2A | |
| **Mechanical Characteristics** | | |
| Inlet, Outlet | Terminal Block | |
| Dimensions (W x D x H) (mm) | 200 x 352 x 450 | 340 x 250 x 110 |
| Net Weight (kg) | 15 | 6 |

## AC-DC BATTERY CHARGERS

FEATURES:

- Multi step charger setup and auto shutdown (tri step)
- Fast charge, normal charge and average charge
- Voltage with auto sensor battery
- Full charge with auto shutdown
- Output short circuit protection
- Universal input voltage suitable for worldwide operation
- Anti-reverse voltage protect device
- Fast charge transferred into slow charge
- Overload protection
- LED status display
- Suitable for lead acid battery.

| Model | Input Voltage | Input Frequency | Output Current | Output Equaliser DC Voltage | Output Floating DC Voltage | Dimensions (L x W x H) mm | Net Weight |
|---|---|---|---|---|---|---|---|
| **AC0212A** | 100-240VAC | 50/60Hz | 2A | 14.6Vdc | 13.7Vdc | 120 x 61.6 x 37.4 | 0.5kg |
| **AC0224A** | 100-240VAC | 50/60Hz | 2A | 29.2Vdc | 27.4Vdc | 120 x 61.6 x 37.4 | 0.5kg |
| **AC0312A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 3A | 14.6Vdc | 13.7Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0324A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 3A | 29.2Vdc | 27.4Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0412A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 4A | 14.6Vdc | 13.7Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0424A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 4A | 29.2Vdc | 27.4Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0512A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 5A | 14.6Vdc | 13.7Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0524A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 5A | 29.2Vdc | 27.4Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0612A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 6A | 14.6Vdc | 13.7Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0624A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 6A | 29.2Vdc | 27.4Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0712A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 7A | 14.6Vdc | 13.7Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0724A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 7A | 29.2Vdc | 27.4Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC0812A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 8A | 14.6Vdc | 13.7Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC1012A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 10A | 14.6Vdc | 13.7Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AC1212A** | 110/220Vdc ±10% AUTO SW | 50/60Hz | 12A | 14.6Vdc | 13.7Vdc | 186 x 88 x 47.5 | 0.8Kg |
| **AM0236A** | 100-240VAC | 50/60Hz | 2A | 44.5Vdc | 41.3Vdc | 164 x 90 x 50 | 0.5kg |
| **AM0424A** | 100-240VAC | 50/60Hz | 4A | 29.6Vdc | 27.4Vdc | 164 x 90 x 50 | 0.5kg |
| **AM0612A** | 100-240VAC | 50/60Hz | 6A | 14.8Vdc | 13.6Vdc | 164 x 90 x 50 | 0.5kg |
| Other currents and voltages available on request | | | | | | | |

## STANDBY DIESEL GENERATOR SETS (10kVA-2000kVA)

### FEATURES:

All units complete with exhaust systems, 12 hour fuel tanks (larger tanks available), batteries, **automatic mains failure control panels and prime power base load control panels.** The panels include standard metering switchgear, control gear and engine protection. Both single and three phase versions available.

### APPLICATIONS:

- Agriculture
- Cold Rooms
- Banking
- Airports
- Building Services
- Hospitals
- Hotels and Entertainment
- Engineering.

### SPECIFICATIONS:

| | |
|---|---|
| **Engine Types:** | Caterpillar, Cummins, Daimler Chrysler MTU, Detroit Diesel VM Sun, Deutz, Hatz, John Deere, Kirloskar, Lister, Lombardini, Perkins, Scania, Volvo and Yanmar |
| **Alternator Types:** | Leroy Somer, Marelli and Mecc Alte |
| **Sizes:** | Petrol powered up to 10KVA Single Phase; Diesel Powered from 10KVA to 2000KVA Three Phase |
| **Voltage Ranges:** | 110V-525V |
| **Frequencies:** | 50/60Hz |
| **Engine Speeds:** | 3000 or 1500 RPM |
| **Generator Sets**: | Available with Base Load and Automatic Mains Failure Control Panels mounted on open steel frame. Weatherproof Silent Canopy. Mobile Trailer mounted. |

All engines and alternators used in the manufacture of Power Generation Equipment conform to the following specifications: **ENGINES: B.S. 5514 1982; ISO 30461; 1DIN6271. ALTERNATORS: B.S. 5000; VDE 30; IEC 23; UTE 5100; NEC 51-111; NEMA – IEEE CSA**.
Where applicable alternators specified for Marine Applications will conform to: **BUREAU VERITAS; LLOYDS REGISTER; AMERICAN BUREAU OF SHIPPING; DNV; RINA; GERMANISHER LLOYDS; KOREAN REGISTER OF SHIPPING; NKK.**

300KVA Automatic mains failure

100KVA, 25KVA, 13KVA remote start/stop and AMF

1000KVA Automatic mains failure Generator Set. MTU 16V 2000 G62 / Leroy Somer (Installed at the Capital Alliance Building, Johannesburg)

30KVA Automatic mains failure soundproof Generator Set. Standard soundproof canopy with sound levels of 65dB(A) at 7 metres in an open field.

# CONSTANT VOLTAGE TRANSFORMERS
1 PHASE

## CONSTANT VOLTAGE TRANSFORMERS (150VA-20kVA)

FEATURES:

- **Input Voltage:** Single Phase, 230V (184-276). Other voltage on request
- **Supply Frequency:** 50Hz
- **Output Voltage:** 230V. Other voltages on request
- **Output Accuracy:** Btter than 3% (1% option available)
- **Harmonic Distortion:** Typically less than 2%
- **Effect of Frequency Change:** 1% change in frequency produces approximately 2.5% change in output voltage
- **Response:** Typically 1-2 cycles (20-40ms)
- **Overload:** Short circuit limited
- **Efficiency:** Approximately 85% at full load.

| Model* | Input/Output | Rating | Current | Dimensions (W x H x D) mm | Mass |
|---|---|---|---|---|---|
| SC150S | 230V/230V | 120W | 0.52A | 290 x 231 x 400 | 17kg |
| SC250S | 230V/230V | 200W | 0.87A | 290 x 231 x 400 | 18kg |
| SC500S | 230V/230V | 400W | 1.74A | 290 x 231 x 400 | 21kg |
| SC750S | 230V/230V | 600W | 2.61A | 290 x 231 x 400 | 24kg |
| SC1000S | 230V/230V | 800W | 3.48A | 290 x 231 x 400 | 26kg |
| SC1500S | 230V/230V | 1200W | 5.22A | 290 x 231 x 400 | 36kg |
| SC2000S | 230V/230V | 1600W | 7.27A | 400 x 263 x 550 | 55kg |
| SC2500S | 230V/230V | 2000W | 9.09A | 400 x 263 x 555 | 59kg |
| SC3000S | 230V/230V | 2400W | 10.91A | 400 x 263 x 565 | 65kg |
| SC4000S | 230V/230V | 3200W | 14.55A | 400 x 263 x 600 | 83kg |
| SC5000S | 230V/230V | 4000W | 18.18A | 400 x 263 x 600 | 90kg |
| SC6000S | 230V/230V | 4800W | 21.82A | 540 x 365 x 908 | 154kg |
| SC7500S | 230V/230V | 6000W | 27.27A | 540 x 365 x 925 | 172kg |
| SC10000S | 230V/230V | 8000W | 36.36A | 540 x 365 x 970 | 212kg |
| SC12000S | 230V/230V | 9600W | 43.64A | 450 x 890 x 1100 | 290kg |
| SC15000S | 230V/230V | 12000W | 54.55A | 450 x 890 x 1100 | 340kg |
| SC18000S | 230V/230V | 14400W | 65.45A | 450 x 890 x 1100 | 435kg |
| SC20000S | 230V/230V | 16000W | 72.73A | 450 x 890 x 1100 | 450kg |

## SERVO TYPE FULLY AUTOMATIC VOLTAGE STABILISER (SINGLE PHASE)

### DESCRIPTION:

The SVC fully automatic voltage regulator consists of a contact voltage regulator, samplingcontrol circuit and service motor as well. It features small waveform distortion, high efficiency and high power factor. It is also not affected by input frequency variations. It can be widely used in most situations where voltage stabilisation is required.

| Model | 500VA | 1kVA | 1.5kVA | 2kVA | 3kVA | 5kVA | 7.5kVA | 10kVA | 15kVA | 20kVA | 30kVA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Input Voltage | 150V-250V | | | | | 160V-250V | | | 150V-250V | | |
| Output Voltage | 220V ± 3% | | | | | | | | | | |
| Frequency | 50Hz/60Hz | | | | | | | | | | |
| Response Time | < 1s (against 10% input voltage deviation) | | | | | | | | | | |
| Efficiency | > 90% | | | | | | | | | | |
| Ambient Temperature | -100C ~ +400C | | | | | | | | | | |
| Relative Humidity | < 90% | | | | | | | | | | |
| Power Factor | 0.8 | | | | | | | | | | |
| Insulation Resistance | > 5MΩ | | | | | | | | | | |
| Length (cm) | 18.5 | 21 | 21 | 27.5 | 29 | 45 | 47 | 47 | 42 | 42 | 42 |
| Width (cm) | 15 | 18 | 18 | 23.5 | 23 | 24 | 26 | 26 | 38 | 38 | 38 |
| Height (cm) | 12.5 | 14.5 | 14.5 | 18.5 | 22 | 18.5 | 22 | 22 | 73 | 73 | 83 |
| Weight (kg) | 4.6 | 6.5 | 7 | 10.5 | 13.6 | 22.4 | 40 | 43 | 75.5 | 80 | 87 |
| Append “SVC-” to the model above for the full part number | | | | | | | | | | | |

## SERVO TYPE FULLY AUTOMATIC VOLTAGE STABILISER (THREE PHASE)

### DESCRIPTION:

- Microprocessor DSP control
- Automatic Voltage Regulation
- Protection against Brownouts and Overvoltages
- Short Circuit & Overload Protection
- Digital meter indicates line voltage and regulated voltage
- LED indicators to show status of working input and output
- Selectable Delay Time
- Built-in transformer, Square transformer or Servo motor
- Surge, Spike & Lightning Protection.

| Model* | 10kVA | 15kVA | 20kVA | 30kVA | 50kVA | 80kVA | 100kVA | 150kVA | 200kVA |
|---|---|---|---|---|---|---|---|---|---|
| Input Voltage | 260-430VAC | | | | | | | | |
| Input Frequency | 50/60Hz | | | | | | | | |
| Output Voltage | 380/400/415VAC | | | | | | | | |
| Output Precision | ± 3% | | | | | | | | |
| Efficiency | 98% | | | | | | | | |
| LED Display | Input Voltage / Output Voltage | | | | | | | | |
| LED Input Status | Blue; indicating phase voltage normal/abnormal | | | | | | | | |
| LED Power Status | Red; indicating Power ON/OFF | | | | | | | | |
| LED Delay Status | Yellow; during delay the LED flashes | | | | | | | | |
| LED Output Status | Blue; indicating output voltage ON/OFF | | | | | | | | |
| Protection | High Voltage, Low Voltage, Overload, High Temp. | | | | | | | | |
| Safety Standards | CE, EN60950, EN55024 | | | | | | | | |
| Operating/Storage Temp. | 00C-400C / -150C-450C | | | | | | | | |
| Operating Humidity | 10% RH - 102% RH, non-condensing | | | | | | | | |
| Dimensions, L x W x H (mm) | 443 x 483 x 858 | | 503 x 553 x 888 | 503 x 553 x 938 | 1250 x 525 x 650 | 1020 x 620 x 1360 | | 1200 x 680 x 1760 | |
| Weight (kg) | 57.8 | 62.3 | 88.4 | 108.4 | 200 | 250 | 285 | 305 | 350 |
| * Append “PDR-“ to the model above for the full part number | | | | | | | | | |
| Bigger ratings available on request | | | | | | | | | |

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Specification or design can be changed at any time without prior notice.

## VOLTAGE STABILISER - ELECTRONIC (15kVA-30kVA)

### FEATURES:

- Wideband voltage regulation range (±25%)
- True RMS voltage sensing ensures accurate regulation even with distorted mains (eg diesel generator)
- Regulates individual phases to within 5% with input variations of up to ±25%
- High capability to temporary overloads (eg aircon units, power supplies etc)
- Over/Under voltage cut-out protects sensitive loads
- TVSS Surge protection
- Volt meter (optional)
- High efficiency - approximately 98% at full load
- Rugged and reliable.

### APPLICATIONS:

- Transmissions and telecommunications
- Radar systems in naval or air navigation
- Process controls
- Computer data processing & numerical control machines
- Photography controls and processes
- Laboratory equipment
- Test equipment
- Electric furnaces
- Illumination
- Medical equipment
- Any electrical or electronic sensitive to voltage variations.

### SPECIFICATIONS:

**Nominal Input Voltage:** 400/230vac 50/60 Hz +/- 25% (3 Wire)
**Nominal Output Voltage:** 400/230vac 50/60 Hz +/- 5% (4 Wire)
**Over Voltage Cut-off at:** 290V input voltage under normal operation (L-N) (U out 230V) 250V input voltage under bypass operation (L-N) (U out 230V)
**Under Voltage Cut-off at:** 160V input voltage under normal operation (L-N) (U out 230V) 200V input voltage under bypass operation (L-N) (U out 230V)
**Output Voltage Accuracy:** 5%
**Overload Rating:** 120% for 60mins; 200% for 10 sec
**Efficiency:** 98% at full load
**Earthing:** The input earth is bonded to the enclosure
**Speed Correction:** +/- 20 milliseconds
**Waveform Distortion:** Negligible

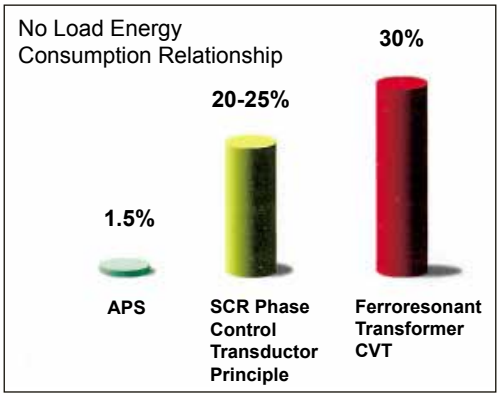
**Effect of load Power Factor:** None
**Maximum Continuous Voltage:** 300V
**Nominal Discharge Current:** 40kA
**Impulse Current Limp (10/350us)kA:** 12kA
**Voltage Protective Level:** ≤ 2.0
**Response Time:** ≤ 100ns
**Environment:** Protection class IP21 (indoor enclosure); IP54 (outdoor enclosure)
**Ambient Operating Temperature:** 0°C to +45°C
**Operating Elevation:** 1000m, over 1000m derate by 2.5% for each 500m

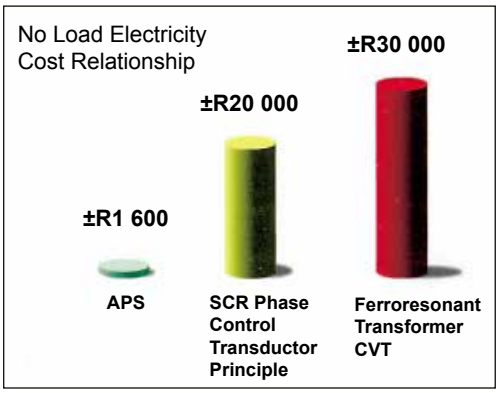
| Model | Description | Rating | Current | Dimensions (L x W x D mm) | Weight |
|---|---|---|---|---|---|
| APS-15kVA-ID | Indoor - 15kVA | 15kW | 66A (Max) | 700 x 385 x 1100 | 210kg |
| APS-22.5kVA-ID | Indoor - 22.5kVA | 22.5kW | 96A (Max) | 700 x 385 x 1100 | 226kg |
| APS-30kVA-ID | Indoor - 30kVA | 30kW | 132A (Max) | 700 x 385 x 1100 | 236kg |
| APS-15kVA-OD | Outdoor - 15kVA | 15kW | 66A (Max) | 775 x 465 x 1210 | 216kg |
| APS-22.5kVA-OD | Outdoor - 22.5kVA | 22.5kW | 96A (Max) | 775 x 465 x 1210 | 232kg |
| APS-30kVA-OD | Outdoor 30kVA | 30kW | 132A (Max) | 775 x 465 x 1210 | 242kg |
| Note: Higher ratings available on request | | | | | |

## VOLTAGE STABILISER - ELECTRONIC (1kVA-75kVA)

### FEATURES:

- High Efficiency
- High Power Factor
- High Reliability
- Low Harmonic Distortion
- Low Environmental Pollution
- Low Electro Magnetic Interference
- APS Range of Products Solve Over 95% of Your Power Problems
- Micro Processor Control
- Micro Size - Quarter the size / weight of traditinal AVR
- Modular Design - Circuit designed in PCB modules, easy for maintenance
- High Efficiency - η ≥ 98% at Full Load.
- High Input Power Factor - Input Power Factor 0.95 ~ 1
- Extra Low No Load Power Consumption - No Load Power Consumption ≤ 1.5%
- Automatic Electronic Bypass - Electronic Bypass, Automatic in Overload / Abnormal conditions
- Low Audible Noise - Audible noise 35 dB at 1 m
- Flexibility for Loads - Suitable for Pure Capacitive / Inductive Load.




Calculation Based on typical South African Electricity Cost, 10 hours per day

### APS Single Phase Models

| Model | KVA | Output Regulation | Type | Current (A) (1 Phase) | Dimensions (H x W x D) (mm) | Weight (kg) |
|---|---|---|---|---|---|---|
| APS-1KB | 1 | ±3% Typical | B | 4.5 | 120 x 220 x 360 | 10 |
| APS-2KB | 2 | ±3% Typical | B | 9.1 | 120 x 220 x 360 | 13 |
| APS-3KB | 3 | ±3% Typical | B | 14.0 | 200 x 380 x 450 | 21.5 |
| APS-5KB | 5 | ±3% Typical | B | 23.0 | 200 x 380 x 450 | 26 |
| APS-7KB | 7 | ±3% Typical | B | 32.0 | 200 x 370 x 550 | 33 |
| APS-10KB | 10 | ±3% Typical | B | 45.0 | 200 x 370 x 550 | 39 |
| APS-15KB | 15 | ±2% Max | B | 68.0 | 200 x 370 x 550 | 45 |
| APS-20KB | 20 | ±2% Max | B | 91.0 | 355 x 835 x 650 | 50 |
| APS-30KB | 30 | ±2% Max | B | 137.0 | 355 x 835 x 650 | 55 |

### APS Three Phase Models

| Model | KVA | Output Regulation | Type | Current (A) (per Phase) | Dimensions (H x W x D) (mm) | Weight (kg) |
|---|---|---|---|---|---|---|
| APS-10KZ | 10 | ±3% Typical | Z | 15 | 355 x 835 x 650 | 70 |
| APS-15KZ | 15 | ±3% Typical | Z | 23 | 355 x 835 x 650 | 85 |
| APS-22KZ | 22 | ±3% Typical | Z | 33 | 355 x 835 x 650 | 100 |
| APS-30KZ | 30 | ±3% Typical | Z | 45 | 355 x 835 x 650 | 115 |
| APS-45KZ | 45 | ±2% Max | Z | 68 | 355 x 835 x 650 | 130 |
| APS-60KZ | 60 | ±2% Max | Z | 91 | 450 x 955 x 800 | 160 |
| APS-75KZ | 75 | ±2% Max | Z | 114 | 450 x 955 x 800 | 185 |
| Note: Higher ratings available on request | | | | | | |

## VOLTAGE STABILISERS - INDUCTIVE (100kVA-1500kVA)

### FEATURES:

- **Strong, durable and high reliability** - No contact point. Capable of sustaining spikes, surges or impulses from non-lionear loads. Long equipment life.
- **Protection -** Redundant circuit control. Event history log for up to 200 events. Phase loss and phase reverse protection. Output over voltage and under voltage protection. Output overload protection.
- **High overload capability -** 100% continuous load. 200% transient current up to 5 minutes. Maximum tolerable transient start current of up to 500%
- **LCD user interface -** Blue backlight, wording in white. RS-485 communication port. Push buttons are lit for convenience in the dark. Remote signal for measurements and control functions to monitor and control your equipment.
- **1500kVA capacity -** The inductive type voltage stabiliser can have a maximum capacity of 1500kVA in one unit.

### APPLICATIONS:

- **Communication Systems -** TV stations, ADSL, Coaxial cable TV systems and components, Radio communication equipment and systems, Satellite and communication equipment, Fiber-optics systems, Lan servers.
- **IT -** Home electrical appliances, Information appliances, Office IT equipment, POS systems.
- **Computer and Computer Peripherals -** Electronic data processing (EDP) centres, Server / Data storage systems, Industrial PC's.
- **General Lab -** Program control systems, Electronic test equipment.
- **F / A -** Production lines, IC (integrated circuit) field, CNC machines, SMT equipment, Auto-Insertion equipment, PCB assembly equipment, Semiconductors (BGA, CSP, Flip Chip, LCD), Production process and control equipment, Printing industry.
- **Medical and Military -** Electronic and Medical equipment, Medical monitoring systems, Airport x-ray scanning equipment, Airport facilities, Airport control tower facilities.
- **Other -** Bioscience, Gas stations, Opto-electronic industry.

| Model** | 0100 | 0125 | 0150 | 0200 | 0250 | 0300 | 0350 | 0400 | 0500 | 0600 | 0800 | 1000 | 1250 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity (kVA) | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 800 | 1000 | 1250 | 1500 |
| Circuit Type | Inductive Voltage Regulator | | | | | | | | | | | | | |
| **Input** | | | | | | | | | | | | | | |
| Phase | 3P3W / 3P4W | | | | | | | | | | | | | |
| Voltage Range* | -13% - +17% (option: -22% - +30%) | | | | | | | | | | | | | |
| Frequency | 47Hz - 63Hz | | | | | | | | | | | | | |
| **Output** | | | | | | | | | | | | | | |
| Phase | 3P3W / 3P4W | | | | | | | | | | | | | |
| Voltage | 200V / 208V / 220V, 380V / 400V / 415V ± 2% (±1%-±5% adjustable) | | | | | | | | | | | | | |
| Voltage Modulation | < 4 V/s | | | | | | | | | | | | | |
| Overload | 125%-40min; 150%-20min; 175%-10min; 200%-5min | | | | | | | | | | | | | |
| Total Harmonic Distortion | < 1% (compared with input) | | | | | | | | | | | | | |
| VA Efficiency | >97% | | | | | | | | | | | | | |
| **Measurement** | | | | | | | | | | | | | | |
| Measurements | Input line voltage and frequency, Output line voltage, Phase voltage, Line current and frequency, VA, W, PF, Load rate, Internal temperature | | | | | | | | | | | | | |
| **Protection** | | | | | | | | | | | | | | |
| Protection Functions | Phase loss, phase reverse, output over voltage & under voltage, output overload, over temperature, over current, redundant cicuit control. Event history log for 200 events. | | | | | | | | | | | | | |
| **User Interface** | | | | | | | | | | | | | | |
| Operation | LCD and Push buttons | | | | | | | | | | | | | |
| Alarm | Alarm 1. Audio. Alarm 2. Activate | | | | | | | | | | | | | |
| Communication | RS-485 | | | | | | | | | | | | | |
| Software | Remote control and monitor | | | | | | | | | | | | | |
| **Environment** | | | | | | | | | | | | | | |
| Working Temperature | -50C-400C | | | | | | | | | | | | | |
| Storage Temperature | -300C-500C | | | | | | | | | | | | | |
| Humidity | < 95% (non-condensing) | | | | | | | | | | | | | |
| Altitude | < 1000 meters | | | | | | | | | | | | | |
| **Cooling System** | | | | | | | | | | | | | | |
| Type | Fan cooling | | | | | | | | | | | | | |
| **Other** | | | | | | | | | | | | | | |
| Noise | < 60dB | | | | | | | | | | | | | |
| Optional | Auto transformer, full time lightning & surge protection, output on & off electromagnetic contactor | | | | | | | | | | | | | |

* Other input ranges on request
** Prefic the model no. with APH-33 for the full part number.

Custom made specifications on request

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## FREQUENCY CONVERTERS (500VA-300kVA)

### FEATURES:

- **Wide Application:** Allows users to simulate Worldwide voltage and frequency for commercial applications (47-63Hz) and Military / Avionics / Marine applications at 400Hz.
- **Pure Sinewave Output:** All models generate very clean sine waveforms output. It is not only a superior power source for R&D and Laboratory, but also a standard power source for EMI/EMC/ Safety testing.
- **Superior Stability:** Output Load Voltage regulation ±1%, Output Frequency ≤ 0.01%.
- **Quick & Convenient 3 Scales of Preset Voltage for High and Low Voltage Simulation:**
  - *High (Surge):* +10% ~ +25% of Present voltage,
  - *Medium:* Preset voltage,
  - *Low (Sag):* -10% ~ -30% of Preset voltage.
- **Direct Select of Six Scales Output Frequency:** 47~63Hz, 50Hz, 60Hz, 2xF (F = Input Frequency), 4xF (F = Input Frequency), 400Hz.
- **2F or 4F Output Testing Frequency for Layer Short Test of Coils Products.**
- **High Overload Capability:** 100% full load continuously; withstand 3 times of inrush current.
- **Protections:** Input Circuit Breaker, Output Circuit Breaker, Instant Trip Circuits for Overload, Over Voltage, Short Circuit, Over Temperature protection and Alarm system.
- **Suitable for Any Load:** Resistive, Capacitive, Inductive and Non-linear load use.

### APPLICATIONS:

#### Industrial:

- **Home Electrical Appliances, Manufacturers of:** Washing Machines, Refrigerators, Vacuum Cleaners, Microwave Ovens, Air Conditioners, Blenders.
- **Electronic Manufacturers of:** Switching Power Supply Testing, Ballasts (in Bulbs, Fluorescent Lamps), Uninterruptible Power Supplies, Chargers, Relays, Passive components.
- **Electric Machinery Manufacturers of:** Compressors, Transformers, AC Fans, Motors.
- **IT Field:** OA Equipment (Fax Machines, Copy Machines, Shredders, etc), Computer & Monitors, Printers, Scanners & Peripherals.

#### General Laboratory:

- AC Power Source Testing
- Life & Safety Testing
- EMC Testing
- OQC (FQC) Testing
- Product Testing
- Product Researches & Developments.

#### 400Hz Output Frequency:

- Aerospace
- Airport Grounding Facilities, including Airport Terminals, Control Towers, Aprons
- Avionics Equipment
- Air Force System Diagnostics
- Military System Diagnostics
- Navy System Diagnostics
- Marine Systems
- Satellite Navigation
- Switching Power Supply of Super Computers
- 400Hz Equipment & Instruments.

### AFC-SERIES 500VA-60kVA SINGLE PHASE

### AFC-SERIES 60kVA-300kVA THREE PHASE

## AFC SERIES - SINGLE PHASE SPECIFICATIONS:

| Model | | | AFC-500 | AFC-11001 | AFC-11003 | AFC-11005 | AFC-11010 | AFC-11015 | AFC-31020 | AFC-31030 | AFC-31045 | AFC-31060 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity (kVA) | | | 0.5 | 1 | 3 | 5 | 10 | 15 | 20 | 30 | 45 | 60 |
| | Voltage | | 110V or 220V ±15%, 1 Phase | | 220V ±15%, 1 Phase | | | | 380V ±15%, 3 Phase 3 or 4 wire | | | |
| | Frequency | | 50Hz ± 3Hz, 60Hz ± 3Hz | | | | | | | | | |
| Output (AC) | Phase | | Single Phase | | | | | | | | | |
| | Voltage | Low | 0~150V | | 5V ~ 150V (L-N) | | | | | | | |
| | | High | 0~300V | | 10V ~ 300V (L-N) | | | | | | | |
| | Frequency | | 47 ~ 63Hz, 50Hz, 60Hz, 400Hz, 2F (2 x Input Frequency), 4F (4 x Input Frequency) | | | | | | | | | |
| | | | Option: 40 ~ 500Hz | | | | | | | | | |
| Maximum Current | | Low | 4.2A | 8.4A | 25A | 42A | 84A | 126A | 168A | 250A | 375A | 500A |
| | | High | 2.1A | 4.2A | 12.5A | 21A | 42A | 63A | 84A | 125A | 188A | 250A |
| Frequency Stability | | | ≤0.01% | | | | | | | | | |
| Load Regulation | | | ±0.2% | | ±1% (linear load) | | | | | | | |
| Total Harmonic Distortion | | | ±0.2% | | ±2% (linear load) | | | | | | | |
| Transient Response | | | 50us Max. | | 2ms Max. | | | | | | | |
| Meter / Res. | 4 Dig. Freq. Met. | | Res. 0.1Hz | | | | | | | | | |
| | 4 Dig. Voltmeter | | Res. 0.1V | | | | | | | | | |
| | Digit Ammeter | | 0.001A | 0.01A | 4 Digit Ammeter / Res. 0.1A | | | | 5 Digit Ammeter / Res.0.1A | | | |
| | 4 Dig. Wattmeter | | 0.1W | 1W | Option | | | | | | | |
| Protection | | | Input Circuit Breaker, Output Circuit Breaker, Electronic Circuits Instant Trp for Over Voltage, Over Load, Over Temperature, Short Circuit Protection and Alarm System | | | | | | | | | |
| Envionment | Ambient Temp. | | 0°C ~ 45°C | | | | | | | | | |
| | Relative Hum. | | 0 ~ 90% Non-condensing | | | | | | | | | |
| | Altitude | | 1500 meter | | | | | | | | | |
| Dimensions W x H x D (mm) | | | 430x520x200 | 430x520x720 | | | 430x750x990 | | 600x970x1240 | | 800x600x1600 | |
| Net Weight (kg) | | | 44 | 89 | 73 | 89 | 150 | 171 | 280 | 333 | 418 | 571 |

## AFC SERIES - THREE PHASE SPECIFICATIONS:

| Model | | | AFC-33006 | AFC-33010 | AFC-33020 | AFC-33030 | AFC-33045 | AFC-33060 | AFC-33075 | AFC-33100 | AFC-33150 | AFC-33180 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity (kVA) | | | 6 | 10 | 20 | 30 | 45 | 60 | 75 | 100 | 150 | 180 |
| | Voltage | | 380V ±15%, 3 Phase 3 or 4 wire | | | | | | | | | |
| | Frequency | | 50Hz ± 3Hz, 60Hz ± 3Hz | | | | | | | | | |
| Output (AC) | Phase | | Three Phase | | | | | | | | | |
| | Voltage | Low | 5V ~ 150V (L-N) | | | | | | | | | |
| | | High | 10V ~ 300V (L-N) | | | | | | | | | |
| | Frequency | | 47 ~ 63Hz, 50Hz, 60Hz, 400Hz, 2F (2 x Input Frequency), 4F (4 x Input Frequency) | | | | | | | | | |
| | | | Option: 40 ~ 500Hz | | | | | | | | | |
| Maximum Current | | Low | 16.7A | 27.8A | 55.6A | 83.3A | 125A | 167A | 208A | 278A | 417A | 500A |
| | | High | 8.3A | 13.9A | 27.8A | 41.7A | 62.5A | 83.3A | 104A | 139A | 208A | 250A |
| Frequency Stability | | | ≤0.01% | | | | | | | | | |
| Load Regulation | | | ≤ ±1% (linear load) | | | | | | | | | |
| Total Harmonic Distortion | | | ≤ ±2% (linear load) | | | | | | | | | |
| Transient Response | | | 2ms Max. | | | | | | | | | |
| Meter / Res. | 4 Dig. Freq. Met. | | Res. 0.1Hz | | | | | | | | | |
| | 4 Dig. Voltmeter | | Res. 0.1V | | | | | | | | | |
| | Digit Ammeter | | 4 Digit Ammeter / Res. 0.1A | | | | | | 5 Digit Ammeter / Res.0.1A | | | |
| | 4 Dig. Wattmeter | | Option | | | | | | | | | |
| | | | Load Balance or No Load: ≤ 1°, 100% Unbalance: ≤ 2° (measured at 50Hz or 60Hz) | | | | | | | | | |
| Protection | | | Input Circuit Breaker, Output Circuit Breaker, Electronic Circuits Instant Trp for Over Voltage, Over Load, Over Temperature, Short Circuit Protection and Alarm System | | | | | | | | | |
| Envionment | Ambient Temp. | | 0°C ~ 45°C | | | | | | | | | |
| | Relative Hum. | | 0 ~ 90% Non-condensing | | | | | | | | | |
| | Altitude | | 1500 meter | | | | | | | | | |
| Dimensions W x H x D (mm) | | | 430x750x990 | | 600x970x1240 | | 800x1090x1600 | | | | 800x600x1600 | |
| Net Weight (kg) | | | 150 | 175 | 345 | 385 | 528 | 635 | 700 | 1000 | 1350 | 1620 |

## GROUND - MILITARY POWER UNITS (500VA-300kVA)

## 400Hz Frequency Converters & 28VDC Power Supplies

### 28VDC Power Supply

FEATURES:

- Used as a DC power supply unit or voltage simulating test for GPU / Military Unit
- 28VDC ±10% Standard Output Voltage; 100Amp to 2,000Amp Output Current
- Automatic Input Line Monitoring
- Output Voltage and Output Current Monitoring
- Current Limit Adjustable
- Auto Feedback Control Circuits. Capable to adjust input and output automatically for constant voltage
- Automatic Line Drop Compensation
- Fixed voltage Fixed current. Interchangeable to have control and protection features.
- **Protection:** *Input Line Loop:* Auto detection and trip for Over Current, Over Voltage, Loss Phase, Phase Reversed. *Output Circuit:* Electronic-controlled Short Circuit Protection.

## 400Hz Solid State Frequency Converter

FEATURES:

- Small, Light & Space Saving: Typically, 1/4 size of motor-generator sets of the same power output rating.
- High Efficiency, Optimum Stability, Superior Heat Dissipation.
- Economical Cost of Ownership.
- **Modular design permits quick and easy replacement:**
  - Typical motor-generator sets downtime is four times greater, often resulting in costly delays, maint. and production schedules.
  - High efficiency features reduce operating costs through 25% and upward utility savings compared to motor-generator sets.
  - On-site repairs are easily accomplished.
  - Motor-generator sets quite often must be removed from location for repairs, resulting in costly rigging and transport charges.
- **Low Noise:** Solid State frequency converters have no moving mechanical parts generating a loud noise and eliminates the need for expensive sound insulation.
- **Individual Phase Regulation at Output:** Excellent voltage regulation under 100% unbalanced load.
- **Output Isolation Transformer:** capable of sustaining CEMF (counter-electromotive force).
- **Option:**
  - 36VAC input voltage or acc. to customer's specifications
  - "Add on module" of Solid State frequency converter and 28VDC power supply
- Low Harmonic Distortion at 3% maximum.

APPLICATIONS FOR BOTH:

- Provides DC current for Airlines / Spacecraft starting
- Working current on avionics or simply provide ground support maintenance
- Provides clean DC power that meets MIL-STD-704 standard for aircraft power
- Input Power Supply Simulating Test of air materials
- Aircraft Manufacturers
- Aerospace Equipment Manufacturers
- Hangars
- Air Force Bases
- Passenger Boarding Bridges (PBB)
- Aprons
- Control Towers
- Meter Control Centers
- Air Force System Diagnostics
- Military System Diagnostics
- Navy System Diagnostics
- R&D Dept. of Military, Defense
- Military Equipment
- Power Supply for Warships
- Power Supply for Radars
- Rotary Engineer Manufacturers.

## AMF SERIES - SINGLE PHASE SPECIFICATIONS:

| Model | | AMF-500 | AMF-11001 | AMF-11003 | AMF-11005 | AMF-11010 | AMF-31020 | AMF-31030 | AMF-31045 | AMF-31060 | AMF-31100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity (kVA) | | 0.5 | 1 | 3 | 5 | 10 | 20 | 30 | 45 | 60 | 100 |
| Circuit Type | | IGBT / Pulse Width Modulation Type | | | | | | | | | |
| Input (AC) | Phase | 1 Phase 2W+G | | | | | 3 Phase 3W+G(Δ) or 3 Phase 3W+N+G(Y) | | | | |
| | Voltage | 110V (B) or 220V (G) ±15% | | 220V (G) ±15% | | | 220V (G) ±15% or 220V/380V (T) ±15% | | | | |
| | Frequency | 50Hz ±3Hz, 60Hz ±3Hz | | | | | | | | | |
| Output (AC) | Phase | 1 Phase 2 W+G | | | | | | | | | |
| | Voltage | 115V (C) or 220V (G), 230V (H) Output Voltage ±10% Adjustable | | | | | | | | | |
| | Frequency | 2-Step Output Frequency: 1. 400Hz Fixed, 2. 350Hz-450Hz adjustable (*can comply with customer's specs) | | | | | | | | | |
| Frequency Stability | | ≤0.01% | | | | | | | | | |
| Load Regulation | | ≤±1% | | | | | ≤±1.5% | | | | |
| Total Harmonic Distortion | | ≤±2% (linear load) | | | | | ≤±3% (linear load) | | | | |
| Meter / Res. | 4 Dig. Freq. Met. | Res. 0.1Hz | | | | | | | | | |
| | 4 Dig. Voltmeter | Res. 0.1V | | | | | | | | | |
| | Digit Ammeter | 0.001A | 0.01A | 4 Digit Ammeter / Res. 0.1A | | | | 5 Digit Ammeter / Res.0.1A | | | |
| Overload Capability | | 120% / 1hr - 150% / 1min. - 200% / 15sec. (25% duty cycle) | | | | | | | | | |
| Protection | | Input Circuit Breaker, Output Circuit Breaker, Electronic Circuits for fast detection and trip off protection for Over Current, Over Voltage, Over Load, Over Temperature, Short Circuit and Alarm system | | | | | | | | | |
| Isolation Resistance | | ≥500Vdc 20MΩ | | | | | | | | | |
| Withstand Voltage | | 1800Vac / 5mA / 1min | | | | | | | | | |
| Cooling System | | Air Forced Fan | | | | | | | | | |
| Ambient Temperature | | -20°C ~ 45°C | | | | | | | | | |
| Relative Humidity | | 0 ~ 90% Non-condensing | | | | | | | | | |
| Dimensions W x H x D (mm) | | 430x520x200 | 430x520x720 | | | 430x750x990 | 600x970x1240 | | 800x1090x1600 | | 800x600x1600 |
| Net Weight (kg) | | 44 | 60 | 73 | 89 | 150 | 280 | 333 | 418 | 571 | 898 |

## AMF SERIES - THREE PHASE SPECIFICATIONS:

| Model | | AMF-33006 | AMF-33010 | AMF-33020 | AMF-33030 | AMF-33045 | AMF-33060 | AMF-33075 | AMF-33100 | AMF-33150 | AMF-33180 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity (kVA) | | 6 | 10 | 20 | 30 | 45 | 60 | 75 | 100 | 150 | 180 |
| Circuit Type | | IGBT / Pulse Width Modulation Type | | | | | | | | | |
| Input (AC) | Phase | 3 Phase 3W+G (Δ) or 3 Phase 3W+N+G(Y) | | | | | | | | | |
| | Voltage | 3W+G : 220V (G) or 3W+N+G : 220V/380V (T) ±15% | | | | | | | | | |
| | Frequency | 50Hz ±3Hz, 60Hz ±3Hz | | | | | | | | | |
| Output (AC) | Phase | 3 Phase 3 W+N+G (Y) | | | | | | | | | |
| | Voltage | 200V/115V (P) Output Voltage ±10% Adjustable | | | | | | | | | |
| | Frequency | 2-Step Output Frequency: 1. 400Hz Fixed, 2. 350Hz-450Hz adjustable (*can comply with customer's specs) | | | | | | | | | |
| Frequency Stability | | ≤0.01% | | | | | | | | | |
| Load Regulation | | ≤±1% | | | | | ≤±1.5% | | | | |
| Total Harmonic Distortion | | ≤±2% (linear load) | | | | | ≤±3% (linear load) | | | | |
| Meter / Res. | 4 Dig. Freq. Met. | Res. 0.1Hz | | | | | | | | | |
| | 4 Dig. Voltmeter | Res. 0.1V | | | | | | | | | |
| | Digit Ammeter | 4 Digit Ammeter / Res. 0.1A | | | | | 5 Digit Ammeter / Res.0.1A | | | | |
| Phase Shift | | Balanced Load / Empty Load: ±2° : 100% Unbalanced Load: ±4° | | | | | | | | | |
| Overload Capability | | 120% / 1hr - 150% / 1min. - 200% / 15sec. (25% duty cycle) | | | | | | | | | |
| Protection | | Input Circuit Breaker, Output Circuit Breaker, Electronic Circuits for fast detection and trip off protection for Over Current, Over Voltage, Over Load, Over Temperature, Short Circuit and Alarm system | | | | | | | | | |
| Isolation Resistance | | ≥500Vdc 20MΩ | | | | | | | | | |
| Withstand Voltage | | 1800Vac / 5mA / 1min | | | | | | | | | |
| Cooling System | | Air Forced Fan | | | | | | | | | |
| Ambient Temperature | | -20°C ~ 45°C | | | | | | | | | |
| Relative Humidity | | 0 ~ 90% Non-condensing | | | | | | | | | |
| Dimensions W x H x D (mm) | | 430x750x990 | | 600x970x1240 | | 800x1090x1600 | | | | 800x600x1600 (x3) | |
| Net Weight (kg) | | 150 | 175 | 345 | 385 | 528 | 635 | 700 | 1000 | 1350 | 1620 |

## SOLAR PANELS AND GREEN ENERGY SYSTEMS

Powerhouse Distributions has launched a reliable, high performance and high quality range of:

- Solar panels
- Solar charge controllers (MPPT)
- Pure and modified sinewave inverters
- Solar water pumps
- Wind turbines
- Deep cycle (solar) batteries.

### SOLAR IN SOUTHERN AFRICA

In the past few years, the number of solar system installations in Africa has grown at a tremendous rate. We at Powerhouse Distribution strive to always come up with new ideas and be at the forefront of the renewable energy sector. We stock a very comprehensive range of solar products and equipment.

### SOLAR PANELS

We have a high grade range of solar panels in the poly and mono-crystalline range designed for high efficiency solar systems. Our panels are available in 12V or 24V from 50W up to and including 200W.

### INVERTERS

Powerhouse only distributes the highest quality equipment and our solar inverters are no exception. We offer units from 150W up to and including 3000W in the pure sinewave and modified sinewave range.

### SOLAR CHARGE CONTROLLERS

Powerhouse has a comprehensive range of solar charge controllers including the state of the art maximum power point tracking units from AEC. These allow your solar panels to operate at their optimum power output voltage, providing higher efficiency up to 97% with lower power losses.

## SUNMAX-1500W SOLAR MPPT CONTROLLER

The Sunmax-1500W developed by AEC can be used universally for 12, 24, 36 and 48V. Its broad DC input voltage range makes sensible system configuration possible for almost all PV modules. Thanks to the integrated MPP tracking, the charger guarantees an energy yield that is 15-30% higher than that of conventional shunt and serial charge controllers.

Auto-selection four-stage (Bulk/Pulse/Float1/Float2) charge mode to reduce the charge time by a third and maximise the system's performance. What is unique about charge controllers of this power range is the high protection class, and the broad temperature range that makes worldwide use, even in harsh ambient conditions, possible. The easy installation and completely automatic customisation of the controller's settings by the SA series make its commissioning very simple.

### Features:

- Parallel capable
- MCU controlled
- LCD display
- High efficiency
- Battery temperature compensated
- Four-stage charging.

| Model | Sunmax-1500W |
|---|---|
| **Input** | |
| Rated Voltage | 40-120Vdc |
| Current (Max.) | 35A |
| Max. PV Array Open Circuit Voltage | 150Vdc |
| **Output** | |
| Nominal Battery Voltage | 12/24/36/48Vdc |
| Max. Charger / Output Current | 60A |
| **Physical Characteristics** | |
| Dimensions (L x H x D, mm) | 165 x 85 x 330 |
| Input/Output Connectors | Hardwired (Terminal Block) |
| Weight (kg) | 3.2 |
| **Computer Interface** | |
| Type | RS-232 |

## GRID-TIE TOUGH INVERTER

- Pure sinewave output
- Microprocessor controlled to guarantee stable charging system
- Multiple operations: Grid tie, Off grid and grid-tie with backup
- LCD display panel for comrehensive information
- Multiple communications
- Built-in MPPT solar charger.

| Model | Tough-5000 |
|---|---|
| **Output Data (AC)** | |
| Maximum AC Output | 5000W |
| Maximum AC Output Current | 22 a.c.A |
| Nominal AC Voltage | 220-240 a.c.V |
| Grid AC Frequency | 50/60Hz, auto-selection |
| Total Harmonic Distortion | < 3% |
| AC connection / Grid forms | TN-C, TN-S, TN-C-S |
| **Input Data (DC)** | |
| Maximum DC Power | 5300W |
| Maximum DC Input Current | 2 x 15 d.c.A |
| Max. number of MPP Trackers | 2 |
| Maximum DC Voltage | 650 d.c.V |
| MPP Tracking Voltage Range | 150-500 d.c.V |
| Peak Power Tracking Voltage Range | 200-460 d.c.V |
| **Efficiency** | |
| MPPT Efficiency | >99.9% |
| Maximum Efficiency | 96.9% |
| Consumption: Operating (standby) / Night | <12.5W / <0.2W |
| **General Specification** | |
| Dimensions (W x H x D) in mm | 405 x 442 x 165 |
| Weight | 25.8kg |
| Cooling Concept | free convection |
| Acoustic Noise Level | < 35dB(A) |
| Operating Temperature Range | -20 to +55 °C |
| Ambient Temperature Range | -25 to +60 °C |
| Humidity | 0 to 95%, |
| Protection Degree | IP65 |
| **Features** | |
| DC Connection | MC4, Tyco |
| AC Connection | AC connectors |
| Communication Interface | RS232, RS485; Bluetooth (Option) |

## ISOLATION TRANSFORMER (10kVA-40kVA)

### DESCRIPTION:

This interface transformer has been specifically designed for use in Africa, where conditions vary from country to country and site to site. The input of the transformer has an easily adjustable tap changer, allowing for voltage variation of 380VAC ~ 415VAC nominal. The output is designed to offer 400VAC as this is the European standard, three phase voltage, of which 95% of equipment manufactured in Europe and Southern Africa require.

The input winding has been designed to withstand high input voltages, often found in African conditions, without experiencing permanent damage. The overall transformer has been designed to tolerate the type of harmonic distortion often associated with non linear loads, like x-ray and telecommunications equipment. The inter-winding screens offer high attenuation of interwinding voltages and good common-mode and differential-mode protection (0V between neutral and earth). Due to the delta primary, phase shifting is eliminated.

The overall, oil-cooled packaging allows for outdoor installation. This feature becomes handy when space and cooling in existing installations are limited. Finally, because of the double wound design and the electro-static screen, you have complete isolation between primary and secondary, providing additional safety between the installation and the uitility.

### FEATURES:

- Interface Isolation Transformer designed for Harsh African conditions
- Easily adjustable tap changer 380V-415V
- Withstands high input voltages
- For non-linear loads
- High attenuation of inter-winding voltages.
- Outdoor installation
- Complete Isolation between primary and secondary.

### SPECIFICATIONS:

- **Input Voltages:** Single Phase 230V; Three phase 380, 400, 415V Delta
- **Frequency:** 48-63Hz; 0.95%
- **Output Voltage:** Single Phase 230VAC; Three Phase 400VAC Star
- **Cooling:** Oil Cooled
- **Application:** Outdoor
- **Nominal Power Range:** From 10kVA 1P; From 20kVA to 40kVA 3P
- **Enclosing:** Weatherproof powder-coated mild steel
- **Vector Group:** Dyn 11
- **Temperature Class:** H
- **Environment:**
  - Ambient 0-45°C;
  - Humidity 0-95%;
  - Altitude Max 3000m, no die-rating

| Model | Input/Output | Rating | Connection | Dimensions (W x H x D mm) | Weight |
|---|---|---|---|---|---|
| **10kVA/IS** | 230/230 | 10kW | Stud | 450 x 535 x 425 | 120kg |
| **20kVA/IS** | 400/400 | 20kW | Stud | 515 x 840 x 696 | 250kg |
| **25kVA/IS** | 400/400 | 25kW | Stud | 515 x 840 x 696 | 250kg |
| **30kVA/IS** | 400/400 | 30kW | Stud | 515 x 840 x 696 | 250kg |
| **40kVA/IS** | 400/400 | 40kW | Stud | 515 x 840 x 696 | 265kg |
| **Note:** Other ratings available on request | | | | | |

## BATTERIES - SEALED MAINTENANCE FREE

| Model | Design Life | Volts | Capacity at 20Hr Rate (Ah) | Dimensions (L x W x H) mm | Mass (kg) |
|---|---|---|---|---|---|
| **12V7-5** | 3-5 years | 12V | 7.2Ah | 151 x 65 x 100 | 2.0 |
| **12V17-5** | 3-5 years | 12V | 17Ah | 181 x 77 x 167 | 5.3 |
| **12V24-5** | 3-5 years | 12V | 24Ah | 166 x 175 x 125 | 7.6 |
| **12V33-10** | 10 years | 12V | 33Ah | 195 x 130 x 168 | 9.7 |
| **12V45-10** | 10 years | 12V | 45Ah | 197 x 166 x 170 | 14.6 |
| **12V65-10** | 10 years | 12V | 65Ah | 350 x 167 x 179 | 22.4 |
| **12V100-10** | 10 years | 12V | 100Ah | 330 x 171 x 222 | 29.0 |

## BATTERIES - SEMI SEALED MAINTENANCE FREE

| Model | Volts | Capacity (Ah) | Dimensions (L x W x H) mm | Mass (kg) |
|---|---|---|---|---|
| **12V36** | 12V | 36Ah | 207 x 175 x 175 | 11.5 |
| **12V45** | 12V | 45Ah | 207x 175 x 175 | 12.1 |
| **12V55** | 12V | 55Ah | 242 x 175 x 190 | 14.1 |
| **12V66** | 12V | 66Ah | 277 x 175 x 175 | 16.4 |
| **12V88** | 12V | 88Ah | 381 x 175 x 190 | 19.5 |
| **12V102** | 12V | 102Ah | 330 x 175 x 240 | 26 |

* Other battery capacities available

# ACCESSORIES
## CABINETS & SNMP CARDS

## SNMP CARDS

- Internal units to be used with UPS's equipped with an intelligen slot
- External units to be used with UPS's already equipped with RS232 communications
- Web server interface
- Linux, MAC and Windows compatible
- Remotely control UPS's
- Battery management features for UPS's being monitored
- SMS and Email capable for several UPS alarms and statuses
- Shut down multiple PC's and/or servers during a power outage.

## BATTERY CABINETS

- Used for all battery types
- In 7 different sizes, selection matrix below for battery size and cabinet sizing requirements.

| No. of Batteries | 7.2Ah | 8Ah | 9Ah | 12Ah | 17Ah | 20Ah | 24Ah | 28Ah | 33Ah | 45Ah | 75Ah | 100Ah |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 6 | 6 | 6 | 4 | 4 | 4 | 2 | 3 | 2 | 2 | 1 | 1 |
| A2 | 12 | 12 | 12 | 8 | 8 | 8 | 4 | 6 | 4 | 4 | 2 | 2 |
| A4 | 24 | 24 | 24 | 16 | 20 | 20 | 8 | 12 | 12 | 8 | 4 | 4 |
| A8 | 60 | 60 | 60 | 40 | 40 | 40 | 16 | 24 | 24 | 16 | 12 | 8 |
| A12 | 90 | 90 | 90 | 60 | 60 | 60 | 24 | 36 | 36 | 24 | 18 | 12 |
| A20 | 150 | 150 | 150 | 100 | 100 | 100 | 40 | 60 | 60 | 40 | 30 | 20 |
| A35 | 270 | 270 | 270 | 180 | 180 | 180 | 80 | 110 | 105 | 70 | 50 | 35 |